THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. XXII. OF VOL. II., 1915.
No. 4813. Vol. CLXXXIX. LONDON, SATURDAY, NOVEMBER 27, 1915. Price 6d.

THE BOOK FOR THE CRISIS.
THE GREATEST AND LATEST
BOOK FOR THE WAR SURGEON.
THE OPERATIONS OF SURGERY. By R. P. ROWLANDS and PHILIP TURNER, Surgeons, Guy's Hospital.
797 Illustrations, 40 in Colour.
6th Edition (JACOBSON). Two Volumes. £2 10s. net.
J. & A. Churchill, 7, Great Marlborough-street.

J. W. THOMSON WALKER, M.B., C.M.Edin., F.R.C.S.Eng.
SURGICAL DISEASES AND INJURIES OF THE GENITO-URINARY ORGANS.
880 pages, 24 Colour and 21 Black-and-White Plates and 279 Illustrations in the Text. Price 25s. net.
"Will hold its place for many years as the best English text-book of the subject."—BRITISH JOURNAL OF SURGERY.
Cassell & Co., La Belle Sauvage, London, E.C.

A STANDARD WORK OF REFERENCE FOR THE PRESCRIBER.
Price 10s. 6d. net; post free (inland) 10s. 10d.
SQUIRE'S POCKET COMPANION
to the new BRITISH PHARMACOPŒIA, 1914.
See Page Cover iv.

By SAMUEL WEST, M.D., F.R.C.P.
DISEASES OF THE
ORGANS of RESPIRATION.
"It is worthy of British Medicine and of the great School in which the author is a teacher."—BRITISH MEDICAL JOURNAL.
Griffin & Co. 2nd Edit. 2 Vols., 36s. net, with numerous illustrations.

NEARLY READY. With 150 Illustrations.
By CHARLES J. HEATH, F.R.C.S. Eng.,
Late Surgeon to the Hospital for Diseases of the Throat, Golden-square, London.
AURAL SUPPURATION:
ITS ARREST, WITH PRESERVATION OF THE HEARING.
The indications for performance of the Author's conservative mastoid operation.
London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

OPERATIVE TREATMENT OF FRACTURES.
By Sir ARBUTHNOT LANE, Bart., M.S.
SECOND EDITION.
With 226 Illustrations. 10s.
The Medical Publishing Company, Ltd., 23, Bartholomew Close, E.C.

BY C. MANSELL MOULLIN, M.D.Oxon., F.R.C.S., Consulting Surgeon to the London Hospital.
Fourth Edition.
ENLARGEMENT of the PROSTATE. Price 6s.
London: H. K. Lewis & Co., Ltd., 136, Gower-street.
WHEN to OPERATE in INFLAMMATION of the APPENDIX.
Third Edition now ready. Price 2s. 6d.
London: J. Bale & Danielsson, Ltd., 83-89, Gt. Titchfield-street.

Just Published. Demy octavo. With 2 Plates. Price 3s. 6d. net.
LIFE: A POEM.
BY BASIL GORDON MORISON, M.D.
With a Preface and Biography of the Author.
"..... marked throughout by mature thought and stately diction."
—ABERDEEN FREE PRESS.
Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden, London.

BY ERNEST CLARKE, M.D., F.R.C.S., Consulting Surgeon to Central London Ophthalmic Hospital, &c.
ERRORS OF ACCOMMODATION AND REFRACTION OF THE EYE.
Third Edition. With 86 Illustrations and Coloured Plates. Price 5s. net.
"..... This book is one of the best."—PRACTITIONER.
London: Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, W.C.

COMPREHENSIVE AND THOROUGH.
ANDERS AND BOSTON'S
MEDICAL DIAGNOSIS.
NEW (2ND) EDITION.
See Saunders' Advertisement on Page 3.

FOURTH EDITION. JUST PUBLISHED.
8vo. Pp. 260. With 40 Illustrations. Cloth. 6s. net.
SQUINT: its Causes, Pathology and Treatment.
By CLAUD WORTH, F.R.C.S.,
Surgeon, Royal London Ophthalmic Hospital (Moorfields), &c.
Bale, Sons & Danielsson, 83, Gt. Titchfield-street, W.

BY E. HURRY FENWICK, F.R.C.S.,
Consulting Surgeon to the London Hospital.
President Second Congress of International Association of Urology.

In Preparation. With 17 Plates and Text Figures.
URINARY TUBERCULOSIS
(ESPECIALLY OF THE FEMALE).
A Study in Clinical and Operative Surgery.
London: J. & A. Churchill, 7, Great Marlborough-street.

Now Ready. viii. + 280 pp. Price 5s. net. With original Photographs and 143 special Prescriptions.
TREATMENT OF DISEASES OF THE SKIN.
By KNOWSLEY SIBLEY, M.D. Camb.
London: Edward Arnold, 41 and 43, Maddox-street, W.

BY P. LOCKHART MUMMERY, F.R.C.S.
DISEASES OF THE COLON AND THEIR SURGICAL TREATMENT.
Numerous Illustrations and Coloured Plates. 10s. net.
Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

Now Ready. Pp. xi. + 259. With 5 Charts. 5s. net.
ON ALCOHOLISM: Its Clinical Aspects and Treatment.
By FRANCIS HARE, M.D., Medical Superintendent of the NORWOOD SANATORIUM, Beckenham.
"Marked by candour, common sense, and moderation ..... likely to become the standard text-book."—BRITISH MEDICAL JOURNAL.
London: J. & A. Churchill, 7, Great Marlborough-street.

JUST PUBLISHED. With 260 Illustrations.
Price 21s. net.
PRINCIPLES OF GENERAL PHYSIOLOGY.
By WILLIAM MADDOCK BAYLISS, M.A., D.Sc., F.R.S.,
Professor of General Physiology, University College, London.
Longmans, Green & Co., 39, Paternoster Row, London, E.C.

Royal 8vo. 395 pages. 12 Plates and 72 Illustrations. Cloth. 15s. net.
GONORRHŒA AND ITS COMPLICATIONS IN THE MALE & FEMALE. By DAVID WATSON, M.B., C.M.
"The best monograph on gonorrhœa in the English language."
Henry Kimpton, 263, High Holborn, London, W.C. —BRIT. MED. JOUR.

COFECTANT

(Regd.)

LOZENGES

containing

"COFECTANT" EUCALYPTUS & PEPPERMINT,

are invaluable for Sterilizing the Mouth and Pharynx, in all cases of Bacillary and Coceal Infection.

They are specially recommended for Septic Sore Throat, and will give instant relief to Singers or Speakers who are suffering from Hoarseness.

EDWARD COOK & Co., Ltd., Bow, LONDON, E.

URIC ACID DIATHESIS

The **FRENCH** *Natural Mineral Water of*

CONTREXÉVILLE PAVILLON

GRAND PRIX
FRANCO-BRITISH EXHIBITION, 1908

This Water is bottled at the Springs, which are situated in the Department of the Vosges, FRANCE, and owned by a **FRENCH** Company.

Regularly used in the principal hospitals and largely prescribed in cases of

GOUT, GRAVEL, DIABETES

Diseases of the Bladder and Arthritis in general.

Samples and Pamphlets forwarded gratis on application to—

INGRAM & ROYLE, Ltd., 45, Belvedere Road, London, S.E.

THE LANCET.

No. 4813. LONDON, SATURDAY, NOVEMBER 27, 1915. Vol. CLXXXIX.

CONTENTS.

The whole of the literary matter in THE LANCET is copyright.

OBSERVATIONS on The Common Intestinal Protozoa of Man: Their Diagnosis and Pathogenicity. By C. M. WENYON, M.B., B.S., B.Sc. Lond., Director of Research in the Tropics to the Wellcome Bureau of Scientific Research.—(WITH PLATE) 1173

ORIGINAL ARTICLES.

The Recognition and Isolation of the Meningococcus in the Naso-pharynx of Cerebro-spinal Fever Contacts. By JAMES MCINTOSH, M.D. Aberd., Special Bacteriologist, Royal Herbert Hospital, Woolwich; and W. E. BULLOCK, M.D. Edin., Temporary Lieutenant, Royal Army Medical Corps. (From the Bacteriological Laboratories of the London Hospital, and of the Royal Herbert Hospital, Woolwich) 1184

Double Episiotomy during Labour. By JOHN PHILLIPS, M.A., M.D. Cantab., F.R.C.P. Lond., Consulting Obstetric Physician, King's College Hospital 1186

The Nitrogen Balance in Diabetes Mellitus and its Importance in Treatment. By P. J. CAMMIDGE, M.D. Lond., M.R.C.S., L.R.C.P. Lond.—(*Illustrated*) 1187

Ophthalmic Notes in a General Hospital in Egypt. By C. WYNN WIRGMAN, M.D. Lond., F.R.C.S. Eng., Lieutenant, Royal Army Medical Corps (T.) 1189

REVIEWS AND NOTICES OF BOOKS.

The Individual Delinquent: a Text-book of Diagnosis and Prognosis for all Concerned in Understanding Offenders. By William Healy, A.B., M.D. 1193

Married Women's Work. Being the Report of an Inquiry undertaken by the Women's Industrial Council. Edited by Clementina Black 1194

Mortality Laws and Statistics. By Robert Henderson 1195

Applied Anatomy: The Construction of the Human Body considered in relation to its Functions, Diseases, and Injuries. By Gwilym G. Davis. Third edition 1195

urrent German Medicine..... 1195

MEDICAL SOCIETIES.

ROYAL SOCIETY OF MEDICINE:

SECTION OF MEDICINE:—Continued Discussion on Paratyphoid Fever..... 1190

SECTION OF OTOLOGY:—Exhibition of Case and Specimen.—Discussion on Skin-grafting in Mastoid Operations 1192

ROYAL ACADEMY OF MEDICINE IN IRELAND:

Paratyphoid Infections.—Cirrhosis and Fatty Liver Showing Primitive Tubular Arrangement of Epithelium 1192

REPORTS AND ANALYTICAL RECORDS FROM THE LANCET LABORATORY.

Dry Peptonoids (Soluble) 1199
Paraffinum Liquidum B.P..... 1199
Maconochie's Army Ration 1200
Duralysol 1200
Lycryl..... 1200

LEADING ARTICLES.

LORD KNUTSFORD'S SPECIAL HOSPITALS FOR OFFICERS.... 1201

THE POOR-LAW MEDICAL OFFICERS' MEMORANDUM.... 1202

ANNOTATIONS.

Intestinal Protozoa of Man.... 1203
Paratyphoid..... 1203
The Midwifery Report of the Manchester Medical Officer of Health 1203
The Healing Art in Ancient Egypt: A New Papyrus..... 1204
Sulphate of Copper in the Treatment of Cancer..... 1205
Foot-and-Mouth Disease in Man 1205
Combined Vaccinations..... 1206
The London School of Medicine for Women 1206
"Cures" for Diabetes 1207

SPECIAL ARTICLES.

The Report of the Medical Research Committee.—II.—General Schemes for Research.—Work in Connexion with the War.—Conclusions 1196

The Belgian Doctors and Pharmacists' Relief Fund: The Week's Subscriptions.—The Appeal for Surgical Instruments 1200

Scotland: Edinburgh School for Children with Skin Disease.—Opening of Out-door Dispensary at Glasgow Lock Hospital.—Aberdeen's High Death-rate.—Precautions against Small-pox.—The Late Professor Buchanan 1208

Ireland: Certification of Insured Persons in Ireland.—Lieut. Walter T. McCurry, R.A.M.C.—Royal Victoria Hospital, Belfast.—Death of Mr. Thomas Duncan, L.R.C.P. & S. Edin., J.P. 1208

Paris: Cupping in the Early Diagnosis of Eruptive Fevers.—Extraction of Bullets from the Bladder by the Natural Passages.—Employment of Powdered Permanganate in the Treatment of Wounds.—The Hot Iron and the Body Louse 1209

Notes from India: The Health of Calcutta.—The Viceroy's Legislative Council: A Bill to Protect Scientific Medical Practitioners.—The Drug Habit on the Frontier..... 1210

Royal College of Surgeons of England.—Annual Meeting of Fellows and Members..... 1210

The Services: Royal Navy Medical Service.—Army Medical Service.—Royal Army Medical Corps.—Special Reserve of Officers.—Territorial Force.—Foreign Orders.—Journal of the Royal Army Medical Corps.. 1211

VITAL STATISTICS:

Health of English Towns ... 1213
Health of Scotch Towns..... 1213
Health of Irish Towns..... 1213

CORRESPONDENCE.

The Use of Antiseptics in Infected Wounds (Sir George Beatson, K.C.B.) 1214

So-called "Trench Fever" (Dr. Henry Robinson) 1214

Tetanus-like Spasm Localised to the Wounded Limb (Mr. R. Atkinson Stoney)..... 1215

Sulphate of Magnesia in Non-amœbic Dysentery (Dr. F. Wyatt Smith) 1216

A Combined Physical Treatment for Disabled Soldiers (Dr. R. Fortescue Fox, Dr. J. Campbell McClure)..... 1216

Evolutionary Etiological Factors in Disease (Dr. J. T. C. Nash)..... 1216

The Use of the Onion and Garlic 1230

OBITUARY.

Henry Charlton Bastian, M.A., M.D. Lond., Hon. M.D.R.U.I., F.R.C.P., F.R.S., Consulting Physician to University College Hospital and to the National Hospital for the Paralysed and Epileptic.—(*With Portrait*).. 1220

Edward Livingston Trudeau, Saranac Lake, N.Y. 1224

Frederick H. Daly, M.D. R.U.I., J.P. 1225

Hugh Brown Currie, M.B., C.M. Glasg..... 1225

THE WAR.

The Casualty List 1217
The Honours List 1217
Foreign Decorations..... 1217
British Hospital Ships: Admiralty Statement 1217
The Central Medical War Committee 1217
Evacuation Hospitals in the Argonne.—(*Illustrated*)..... 1217
The Position of Medical Students..... 1219
Hospitals in Serbia 1219
Vacancies for Medical Officers 1219
Convoy of Motor Ambulances: Farmers' Red Cross Gift 1219
University of Edinburgh and the War 1219
Registration of Nursing Uniform 1219
The Army's Winter Kit..... 1219
The Gazette of the 3rd London General Hospital, Wandsworth 1220
Factories and Workshops during War 1220
The Engineering Institutions' Volunteer Engineer Corps... 1220

MEDICAL NEWS.

The Late Dr. John H. Dauber 1183
The Proposed New Drug Tariff: Action of the Aberdeen Chemists 1195
Death of Dr. George Augustus Jeffery 1200
Strike at a Sanatorium 1207
Urgency Cases Hospital 1211
St. Bartholomew's Hospital and the National Guard 1216
Society of Apothecaries of London: Pass-list 1225
University of London: Pass-list..... 1225
University of Bristol 1225
Central Midwives Board 1226
Registration of Massage Establishments 1226
Books for British Civilian Prisoners of War 1226

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Midwives (Scotland) Bill..... 1226
House of Commons 1226

Appointments..... 1229
Vacancies..... 1229
Births, Marriages, and Deaths 1229
Notes, Short Comments, and Answers to Correspondents.. 1230
Medical Diary..... 1230
Meteorological Readings..... 1231
Acknowledgement of Communications received 1232

FOR INDEX TO ADVERTISEMENTS SEE PAGES 2 & 4.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

ARNOLD:—
Sibley ..... Treatment of Diseases of the Skin .. Cover 1

BAILLIERE, TINDALL & COX:—
Bigg..... Indigestion 5
" ..... War Diseases (Typhus, Enteric, Dysentery, and Cholera) 5
Clarke, E... Errors of Accommodation and Refraction of the Eye Cover 1
Heath..... Aural Suppuration: Its Arrest, with Preservation of the Hearing .... Cover 1
Morison.... Life ..... Cover 1
Mummery .. Diseases of the Colon and their Surgical Treatment .. Cover 1

BALE, SONS & DANIELSSON:—
Moullin.... When to Operate in Inflammation of the Appendix .. Cover 1

PAGE

BALE, SONS & CO.—(Continued).
Worth .... Squint: its Causes, Pathology and Treatment .. Cover 1

CASSELL & CO.:—
Walker .... Surgical Diseases and Injuries of Genito-Urinary Organs Cover 1

CHURCHILL, J. & A.:—
Fenwick .. Urinary Tuberculosis Cover 1
Hare ..... On Alcoholism: Its Clinical Aspects and Treatment .. Cover 1
Rowlands & Turner .. The Operations of Surgery .... Cover 1
Squire's Pocket Companion to the British Pharmacopœia, 1914 Cover iv
Thorne, Bezly .... Schott Methods of the Treatment of Chronic Diseases of the Heart 5

PAGE

GRIFFIN & CO.:—
West ..... Diseases of the Organs of Respiration Cover 1

KIMPTON:—
Watson .... Gonorrhœa and its Complications in the Male & Female Cover 1

LEWIS & CO:—
Moullin .... Enlargement of the Prostate .... Cover 1

LONGMANS, GREEN & CO.:—
Bayliss .... Principles of General Physiology .. Cover 1

MEDICAL PUBLISHING CO.:—
Lane, Sir A..... Operative Treatment of Fractures. Cover 1

PULMAN & SONS:—
Elliot ..... Sclero-Corneal Trephining in the Operative Treatment of Glaucoma 5

PAGE

SAUNDERS COMPANY:—
Anders & Boston .. Medical Diagnosis .. 5
Anders and Boston's Medical Diagnosis ..... Cover 1
Bandler .... Medical Gynæcology. 5
Kemp ..... Stomach, Intestines, and Pancreas 5
Thomson .. Clinical Medicine 5

WRIGHT & SONS (Bristol):—
Index of Treatment 5

MEDICAL LIBRARIES, &c.:—
Behnke—
Stammering, Lisping, and Cleft-Palate Speech 5
Kelley—
Stammering.....
Matthews—
Wood: Application of Trusses to Hernia 5
Squire's Pocket Companion to the new British Pharmacopœia, 1914 ..... Cover 1

OFFICIAL AND GENERAL ANNOUNCEMENTS

APPOINTMENTS VACANT:—
Asansol Mining Settlement, Bengal 51
Baldovan Institution for the Feeble-Minded 51
Bolton Infirmary and Dispensary 52
Borough Hospital, Birkenhead .. 50
Bristol General Hospital..... 51
Bristol Royal Infirmary 51
Cambridgeshire Asylum, Fulbourn 52
City of Birmingham Education Committee 52
County Asylum, Dorchester 51
County Borough of Wigan Education Authority 52
David Lewis Northern Hospital, Liverpool 51
Derbyshire Hospital for Sick Children 52
Derbyshire Royal Infirmary 52
Devonshire Hospital, Buxton, Derbyshire 51
Elder Dempster & Co., Liverpool.. 53
Glamorgan County Asylum, Bridgend 52
Guest Hospital, Dudley 50
Hampstead General Hospital 51
Hospital for Consumption, &c., Brompton 53
Kesteven County Asylum 53
Leeds General Infirmary 52
Leeds Public Dispensary 52
Leicester Royal Infirmary 52
London Temperance Hospital 51
Lord Derby War Hospital, Warrington 52
Manchester Northern Hospital for Women and Children 51
North Riding Infirmary, Middlesbrough 51
Putney Hospital 52
Queen's Hospital for Children, Bethnal Green 52
Rhondda Urban District Council. 52
Royal Albert Edward Infirmary and Dispensary, Wigan 51
Royal College of Physicians 51
Royal London Ophthalmic Hospital 52
Royal National Hospital for Consumption, Ventnor 52
Royal Portsmouth Hospital, Portsmouth 52
Royal South Hants and Southampton Hospital 51
St. Mary's Hospital, Paddington . 51
St. Pancras Infirmary 53

APPOINTMENTS—(Continued).
South London Hospital for Women 51
Southampton Free Eye Hospital 50
Wandsworth Union Infirmary.... 52
Wounded Allies Relief Committee, Kingsway 53

ASSISTANCIES, MEDICAL:—
Arnold & Sons, Giltspur-street.... 53
Campbell, Adelaide-road..... 53
D 39, Belsize Park-gardens 53
Mac, Barnes..... 53
No. 631, L.O., Strand 53
No. 646, L.O., Strand 53
No. 647, L.O., Strand 53
No. 648, L.O., Strand 53
Secretary, Penybont 53
Turner, Adam-street 53
X., Finsbury Pavement..... 53

ASYLUMS, HOMES, &c.:—
Abbotswood House, Cinderford .. 48
Ashwood House, Kingswinford .. 45
Barnsley Hall, Bromsgrove 48
Barnwood House Hospital 48
Bishopstone House, Bedford..... 48
Brunton House, Lancaster 45
Buntingford House Retreat, Buntingford 48
Camberwell House, Peckham-road 48
Capel Lodge Retreat and Sanatorium, near Folkestone 48
Cheadle Royal..... 48
Clarence Lodge, Clapham Park .. 45
Colthurst House, Alderley Edge .. 50
Coppice, The, Nottingham 48
Dalrymple House, Rickmansworth 48
David Lewis Colony, Alderley Edge 50
Duff House, Banff..... 49
Edgar Allen Institute, Sheffield .. 45
Ghyllwoods 48
Grove House, Church Stretton.... 46
Grove, The, Catton, Norwich..... 48
Haslemere Nursing Home 50
Haydock Lodge, Newton-le-Willows 47
Home for Epileptics, Maghull 50
Invernith Sanatorium, Collinsburgh 49
Littleton Hall, Brentwood 50
London Fever Hospital..... 48
Mailing Place, Kent 48
Melbourne House, Leicester 48
Mendip Hills Sanatorium 50
Meyrick, Brighton 50
Moat House, Tamworth 48
Newmains Retreat, Lanarkshire.. 48

ASYLUMS—(Continued).
New Saughton Hall, Polton, Midlothian 47
Nordrach-on-Dee, Banchory 49
Northumberland House, Finsbury Park 47
Northwoods House, Winterbourne 47
No. 381, L.O., Strand 50
No. 412, L.O., Strand 50
Otto House, West Kensington 45
Peckham House..... 47
Pendyffryn Hall Sanatorium, Nordrach-in-Wales 49
Plympton House, Plympton 46
Portsmouth Corporation Mental Hospital 45
Royal Earlswood Institution for Mental Defectives 47
St. Andrew's Hospital, Dollis Hill 50
St. Andrew's Hospital, Northampton 48
St. George's Retreat, Burgess Hill 48
St. Luke's Hospital for Mental Diseases 45
St. Raphaels, Buxted, Sussex 48
Springfield House Private Asylum, Bedford 45
Stretton House, Church Stretton.. 48
The General Manager, Cravenstreet 50
The Grange, near Rotherham 48
Vale of Clwyd Sanatorium 49
Warneford Asylum, Oxford..... 45
Wye House, Buxton 48

HEALTH RESORTS, BATHS, &c.:—
Alexandra Therapeutic Institute.. 50
Droitwich Brine Baths 50
Peebles Hotel Hydro..... 50
Smedley's, Matlock 50

HOUSE & ESTATE AGENTS.—
Bedford & Co., Wigmore-street.... 54
Elliott, Son & Boyton, Vere-street 54
Ley Clark, Wimpole-street 54

LIFE & FIRE ASSURANCES, &c.:—
General Life Assurance Co. 42
National Provident Institution .. 42
Prudential 43

MEDICAL ACCOUNTANTS, &c.:—
Turner 54

MEDICAL AGENTS:—
Fieldhall, Limited 55
Manchester Clerical, &c., Association 54
Medical Agency 55
Needes, Herbert 55

MEDICAL AGENTS—(Continued).
Needes, J. C. 55
Peacock & Hadley 55
Scholastic, Clerical, &c., Association 54
Turner 55

MEDICAL SCHOOLS:—
(LONDON.)
London School of Clinical Medicine 42

NURSING INSTITUTES:—
Army and Navy Male Nurses Co-operation 43
Co-operation of Temperance Male and Female Nurses 44
General Nursing Association 45
Hospital for Sick Children, Great Ormond-street 45
London Nurses' Association 44
London Temperance Male and Female Nurses Co-operation .. 44
Male Nurses Temperance Co-operation 45
Mental Nurses Association 45
Mental Nurses' Co-operation 45
Nurses' Co-operation, Portland-place 45
St. John's House 45
St. Luke's Hospital, E.C. 45
Temperance Association of Male Nurses, Ltd..... 44
Temperance Male Nurses Co-operation 44
The Retreat, York 44

OFFICIAL NOTICES:—
City of London Lying-in Hospital 42
London School of Massage 42
London School of Tropical Medicine 42
North-East London Post-Graduate College..... 42
Queen Charlotte's Lying-in Hospital 42
Royal (Dick) Veterinary College, Edinburgh..... 42
University of Cambridge 42

PARTNERSHIPS & PRACTICES:—
Arnold & Sons, Giltspur-street.... 55
K. D., Giltspur-street 55
Lee & Martin, Birmingham 55
104, Ledbury-road, Westbourne Grove 55
No. 644, L.O., Strand 54
No. 645, L.O., Strand 54
Turner, Adam-street 55

RAILWAY & STEAMSHIP CO.'S.:—
New Zealand Shipping Co..... 43

SCHOOLS, PREPARATORY, &c.:—
Paton, Cannon-street..... 42

TUTORS & LECTURERS:—
Beckton 42
Med. Correspondence College 42
Weymouth 42

For Index to Trade and Miscellaneous Advertisements see page 4.

Observations ON THE COMMON INTESTINAL PROTOZOA OF MAN:

THEIR DIAGNOSIS AND PATHOGENICITY.

By C. M. WENYON, M.B., B.S., B.Sc. LOND.,

DIRECTOR OF RESEARCH IN THE TROPICS TO THE WELLCOME BUREAU OF SCIENTIFIC RESEARCH.

(*With Plate.*)

AT the present time, while there is a great influx of individuals into this country who have been residing for a longer or shorter period in tropical or sub-tropical countries, certain types of infection, which usually only come to the notice of those interested especially in tropical medicine, are likely to be encountered by many who have not had any previous opportunity of studying the organisms present. Having had during a period of ten years as protozoologist to the London School of Tropical Medicine abundant opportunity of studying the protozoal infections of man both in this country at the Albert Dock Hospital attached to the Tropical School and in many parts of the world abroad, I have thought it useful to give a short account of one group of protozoal organisms which infect human beings, especially in warm climates. I refer to those Protozoa which inhabit the digestive tract, some of which are definitely pathogenic and invade the tissues, others which are less certainly injurious, and, finally, some against which it is difficult to produce any evidence of harmful action whatever.

The Protozoa which are to be found in the intestine belong to three of the great subdivisions into which these organisms are grouped. Belonging to the Rhizopoda we have the definitely pathogenic *Entamœba histolytica*, the quite harmless *Entamœba coli*, and a small amœboid organism which on account of its resemblance to the free-living water amœba, *Amœba limax*, is often considered to be actually this amœba or one nearly related to it which has taken up a temporary existence in the human intestine. All these inhabit the large intestine and cæcum.

To the group of the Mastigophora belong three flagellates which are commonly to be found in the human intestine—*Trichomonas intestinalis*, *Tetramitus mesnili*, and *Lamblia intestinalis*. Of these *Lamblia intestinalis*, inhabiting the upper part of the small intestine, has the greatest claim to being pathogenic; *Tetramitus mesnili* has been supposed to give rise to intestinal irritation followed by diarrhœa, while *Trichomonas intestinalis* is generally regarded as quite harmless, though Escomel in South America claims to have cultivated this organism and to have produced diarrhœa in dogs by injection of these cultures. The two latter flagellates inhabit chiefly the large intestine and cæcum, and are to be found in greatest number when the intestine is deranged for some reason or another, for the change in the intestinal contents resulting from such diseases as typhoid, dysentery, &c., seems to induce a very active multiplication of these organisms. There are other flagellates which are much less frequently met with. These are species of *Bodo*, *Cercomonas*, and *Prowazekia*, simple organisms, each with two flagella, which occur especially in diarrhœic conditions and which are possibly only free-living flagellates which have found a suitable medium of development in the altered condition of the gut. Several members of the group Ciliata have been described, but only one of these has any claim to being a common parasite. This one is *Balantidium coli*, a large organism which lives in the large intestine. Pigs are generally infected with this ciliate, which, escaping from them in the encysted condition, gains entrance to the human intestine, and by actual invasion of the wall of the large intestine produces the serious condition known as balantidial dysentery.

In this paper I wish to give a short account of these various Protozoa, more especially from the point of view of diagnosis and the methods I have found useful for their identification. That such identification is important goes without saying, for on it may depend the actual treatment of any individual case.

Some years ago I read a paper before the British Medical Association on the subject of the intestinal entamœbæ of man and their differentiation. I showed there that the pathogenic *E. histolytica* was most readily distinguished from the harmless *E. coli* by the examination of the encysted forms—forms which have protected themselves by the secretion of resistant transparent capsules which will enable them to withstand exposure after their escape from the human intestine and until they can succeed in gaining entrance to another individual. Now with all the intestinal Protozoa of man, with the possible exception of *Trichomonas intestinalis*, infection spreads from one individual to another by means of encysted forms which, as far as we know, undergo no development outside the body, but simply lie about in water till they are ingested by another individual. If by any chance an unencysted protozoon should escape from the intestine, and this happens very commonly when infected individuals have attacks of diarrhœa which flush out the intestine, such forms invariably die quickly, and it is difficult to see how they can be responsible for the spread of infection. In the case of *Trichomonas intestinalis*, however, encysted forms have not been definitely described, and it is perhaps owing to this that *Trichomonas intestinalis* survives in fæces it may be a week or more after escape from the body in the unencysted condition. With this possible exception, in the normal course of events it is only the encysted forms of these Protozoa which escape in the fæces and are destined for future development in another human host. Manifestly, then, it is important to be able to recognise not only the free-living forms of the intestinal Protozoa as they move about in the intestine, but also the encysted forms which, corresponding to the eggs of worms, may in the same way be the only indications that there is an infection of the intestine with any particular organism. The finding of the eggs of *Ankylostoma duodenale* or of *Ascaris lumbricoides* in the fæces of an individual shows that the intestine is harbouring these worms, and similarly the discovery in the fæces of the encysted forms of *Entamœba histolytica* or *Lamblia intestinalis* shows that an infection with these Protozoa exists and, in the case of the former at any rate, calls for energetic treatment, for such an infection may be the cause of the spread of amœbic dysentery to other individuals, or may be followed by a fatal attack of dysentery in the person himself.

Naturally enough, the intestinal Protozoa are usually encountered when there is some definite

intestinal derangement, for it is only in such conditions that the fæces are submitted to examination. The finding of these comparatively large and active organisms, sometimes in enormous numbers, is likely to lead to the conclusion that they must be the determining factor of any intestinal symptoms which may be present. The findings can only be controlled by the examination of normal individuals. In tropical countries frequently over 50 per cent. of the normal population harbour *Entamœba coli*, and Schaudinn showed some years ago that in certain parts of Germany a still larger percentage were infected. Similarly, in tropical countries flagellate infections of the intestine are exceedingly common apart from symptoms, so that when they are met with in cases of diarrhœa one must very carefully exclude all other causes, bacterial or irritant, before concluding that the flagellates have produced the condition in question. In the case of *Entamœba histolytica* and *Balantidium coli* there are produced by these Protozoa extensive lesions of the bowel, in the tissues of which they may be found. They wander far afield and produce lesions in the mesenteric glands, liver, and other organs, while, experimentally, animals may be infected and in them are produced lesions similar to those in man. In these cases it is impossible to doubt the pathogenicity of the Protozoa. In the case of the flagellate infections, however, no definite lesions of the gut occur, and as no satisfactory post-mortem material can be obtained owing to the rapid degeneration of the Protozoa after the death of the host it is very difficult to obtain any definite proof of pathogenicity. Experimental infections in animals have not given very satisfactory results, and no one has yet been able to obtain pure cultures of these flagellates. The subject is a difficult one and requires further investigation before we can definitely assert that the intestinal flagellates are pathogenic.

Another point which must be borne in mind is that the intestinal flagellates, in common with intestinal bacteria, sometimes invade the tissues shortly before or after death. This is due apparently to a diminished resistance on the part of the intestine, which permits the passage of organisms which normally only live in the lumen of the gut. Cases of this invasion are fairly common in animals. Gonder, for instance, found *Lamblia* in the blood stream of a fowl, and quite recently Basile in Italy has noted a case of *Lamblia* of the liver of a rat, which was dotted over with white cysts containing a fluid in which the flagellates were living. Basile inoculated a rat with some of this fluid intraperitoneally and later discovered *Lamblia* in the liver and mesenteric glands. These are exceptional cases, but so long as they occur there is the possibility that the invading flagellates will give rise to symptoms of one kind or another.

I will now give a description of the various Protozoa mentioned above, the method of their detection, and what is known of their habits and pathogenicity.

Entamœba Coli (Figs. 27–32).

This amœba was first satisfactorily described by Casagrandi and Barbagallo, and it is perhaps the commonest Protozoon of the human intestine. It seems to be a perfectly harmless organism, and in many parts of the world more than half the healthy population are infected. It inhabits the large intestine and cæcum, where it crawls about by its amœboid movements amongst the intestinal contents and more especially over the surface of the gut. It consists of a mass of cytoplasm which varies in diameter from 10 to 30 microns, though larger or smaller forms may occur. It has a single large spherical nucleus consisting of a nuclear membrane on the surface of which are irregular masses of chromatin which appear as greenish refractile granules in the living condition. At the centre of the nucleus a granule, the karyosome, can be seen. The cytoplasm is often very much vacuolated, the vacuoles containing bacteria, yeasts, and even encysted and unencysted flagellates, which the amœba has ingested. It is most vacuolated and granular towards the centre and becomes less so towards the periphery, but there is, as a rule, no sharp distinction between ectoplasm and endoplasm. The whole organism tends to have a greyish colour, is of liquid consistency and not highly refractile. When it moves it throws out pseudopodia, which are blunt structures, and in these again no clear line of demarcation can be made out between ectoplasm and endoplasm, unless at the very commencement of pseudopodium formation. The nucleus can usually be seen clearly in the living condition unless it is obscured by vacuoles and their contents, and it changes its position in the cytoplasm with the movements of the amœba. The amœba even when observed in the warm stage moves very slowly, so that occasionally the only sign of life is a gradual change in shape.

Reproduction is by simple division. The single nucleus divides, and this is followed by division of the cytoplasmic body. The two amœbæ thus formed increase in size and later divide again. In this way the infection of the large intestine is maintained. The size of the amœbæ depends largely on the rate of multiplication, for if the divisions succeed one another rapidly before there has been time for growth to the original size then the amœbæ tend to decrease in size, and conversely when division is slow they tend to be large.

As reproduction is proceeding in the large intestine certain individuals cease to multiply; they discharge all their food contents and, becoming spherical, secrete round themselves a protective covering or cyst. This is a transparent capsule very much like, but not so thick as, the shell of an ankylostome egg. When encystment has taken place a passive body is produced, which is carried down the intestine and eventually is discharged in the fæces. During the passage down the large intestine the single nucleus possessed by the encysting amœba divides into two, each of these divides again to produce four, and the four again to produce eight. (Fig. 31.) Cysts may be discharged in any of these stages of development, but most usually it is the fully developed cyst containing the single mass of cytoplasm in which are embedded eight nuclei which is met with in the fæces. The size of the cyst of *E. coli* varies between 15 and 20 microns, though slightly larger and very exceptionally smaller ones occur. After escape from the body they undergo no change till they enter a new host, probably in drinking water. Under the action of the digestive juices, according to the investigations of Casagrandi and Barbagallo, the contents of the cyst divide into eight small amœbæ, which escape into the intestine by rupture of the cyst. The fate of these small amœbæ has not been definitely traced, though it is suggested that they are in reality gametes or sexual forms which conjugate in pairs to form four amœbæ, which

proceed to grow into the ordinary adult forms of *E. coli*. Schaudinn described a complicated sexual process (autogamy) as taking place in the cyst, but so far this has not received confirmation.

Infection of the intestine with *E. coli* is most readily recognised by the detection of the very characteristic encysted forms. The amœbæ themselves often occur in the fæces, but their differentiation, especially for the uninitiated, from *E. histolytica* may be a matter of great difficulty. The cysts, however, are easily recognised as clear refractile spherical bodies of very sharp outline which are readily seen with a 1/6 or 1/8 objective. In searching for them, and indeed for all intestinal Protozoa, it is essential to use only small quantities of material well diluted with water or preferably saline and covered with a cover-glass. It is also necessary to be careful that the cover-glass is not floating about on the slide, for this will prevent satisfactory examination with the 1/12 oil immersion. A rather dull light must be used, and I have found that the details can be more readily detected by reducing the light by lowering the condenser rather than by shutting out the light by means of the diaphragm. Under such conditions with 1/6 objective it may be possible to detect within the cyst the characteristic eight nuclei. They appear as very faint greyish granular rings with a central dot or karyosome, and as the cyst is spherical they are not all in focus at the same time; to see them all one must focus up and down to bring different planes into view. The nuclei, however, are best seen by using the 1/12 inch oil immersion lens and a No. 2 eyepiece. Here, again, it is generally necessary to reduce the light by lowering the condenser slightly. It is very important to see the nuclei properly, for on them depends the absolute diagnosis of the cyst. They do not stand out in very great contrast to the cytoplasm within the cyst, but when once seen they are found to be quite sharply defined structures. They may be much more easily seen in one cyst than in another. The nuclei may be more clearly seen after the addition of a little iodine solution, as explained at the end of the paper. It is also important to determine the size of the cyst.

Occasionally abnormal forms occur. The commonest abnormality is the presence in the cytoplasm within the cyst of a large vacuole, which has the effect of pushing the nucleus to the side (Fig. 32). It apparently hinders nuclear division to such an extent that these cysts frequently contain only two and rarely four nuclei. Another irregularity which I have very rarely seen are cysts in which there are 16 instead of eight nuclei, while occasionally one meets with chromidial bodies like those so commonly seen in cysts of *E. histolytica*.

An individual infected with *E. coli* may retain the infection for years, as I have observed in some cases, and this in spite of treatment with intestinal disinfectant or treatment with emetine, which has such a marked effect in destroying the pathogenic *E. histolytica*. It is, perhaps, worthy of note that amœbæ closely resembling, if not identical with, *E. coli* have been found in rats, mice, monkeys, and other animals.

Entamœba Histolytica (Figs. 33–40).

Of all intestinal Protozoa of man this one is the most dangerous in being the cause of amœbic dysentery and liver abscess. The dangers, however, are now largely reduced owing to the reintroduction by Rogers of emetine in the treatment of these diseases.[1] This drug appears to be a specific and has a most remarkable action upon *E. histolytica*, which disappears rapidly from the intestine when it is administered. This organism is undoubtedly the one studied and described by Lösch in Petrograd in 1873–4 under the name of *Amœba coli*, a name which later was employed for the non-pathogenic species.

E. histolytica differs little in size from *E. coli*, and, like it, is primarily an inhabitant of the large intestine. It has, however, the power of invading the tissues and multiplying in distant organs like the liver if it is carried there in the blood stream. There are two distinct types of this amœba—one the tissue-invading form known as the "tetragena" form, and the other a smaller form known as the "minuta" form, which lives, like *E. coli*, on the surface of the mucous membrane. The former is the one which is found in acute amœbic dysentery, when the stool may consist of little more than blood and slime. As the acute symptoms abate and the stools return to the normal the tissue-invading forms become replaced largely by smaller amœbæ, which appear to maintain the infection of the gut while tissue invasion is in abeyance. They can often be found in numbers in stools which are quite or almost normal, though individuals thus infected are liable to repeated mild attacks of diarrhœa in which small quantities of blood and mucus are found, and they may at any time relapse into the acute dysenteric condition when the large tissue-invading forms reappear in the fæces. During the height of a dysenteric attack the only forms to be found in the fæces are the large tissue-invading forms about 15 to 30 microns in diameter. (Figs. 33 and 38.) They are much more refractile and greenish-looking than *E. coli*; the spherical nucleus is smaller and has upon its membrane much finer granules of chromatin than that of *E. coli*, and on this account the nucleus is more difficult to detect in the living amœba. There is, further, a very clear distinction between ectoplasm and endoplasm, and when pseudopodia are formed they are found to consist entirely of highly refractile ectoplasm. The endoplasm may be vacuolated, but contains red blood corpuscles and leucocytes rather than bacteria, yeasts, and other foreign bodies. The presence of red blood corpuscles is a great aid to diagnosis, for *E. coli* does not ingest them. The movements of this amœba resemble, but are much more active than, those of *E. coli*. The tissue-invading forms multiply by simple division but do not encyst, in consequence of which encysted forms of this amœba are not found during a dysenteric attack. It might be difficult, therefore, to distinguish this amœba from *E. coli*, but for all practical purposes, if there are definite symptoms of dysentery with blood and mucus in the stool and large active amœbæ occur especially in the mucus, and some of them are found to contain red blood corpuscles, it can be assumed that the case is one of amœbic dysentery due to *E. histolytica*. *E. coli* might conceivably occur under such conditions, but experience has shown me that this is practically never the case.

The greatest difficulty in diagnosis occurs when the acute symptoms have abated and the stools have almost returned to the normal. As already explained, under these conditions the large forms of the amœba are becoming replaced by smaller ones, which vary in size from 10–20 microns.

[1] THE LANCET Oct. 19th, 1912, p. 1062.

(Figs. 39 and 40.) Unfortunately they often resemble *E. coli* closely, so that a diagnosis may be impossible if one had only the amœbæ to go by. Luckily, however, it is at this stage that cyst formation takes place, and while the infection is maintained by the multiplication of these smaller amœbæ by simple division, as in the case of *E. coli*, certain individuals become encysted. (Figs. 34–37.) The cysts escape from the intestine, and they have characters which enable them to be recognised fairly readily. They are spherical, but not so accurately spherical as the cysts of *E. coli*. They are smaller, having a diameter of 10–14 microns, and in accordance with the higher refractiveness of *E. histolytica* the cysts are more refractile, so that the contents are more difficult to see clearly. Nuclear multiplication leads to the production of two and then four nuclei, and only very rarely indeed eight. In the case of *E. coli* the cysts which escape have nearly all reached the eight-nuclear stage, whereas with the cysts of *E. histolytica* it is very usual to find the cysts voided in all stages of development. The fully-formed cyst of *E. histolytica* is then a spherical greenish refractile body 10–14 microns in diameter enclosing a single mass of cytoplasm containing four nuclei, which often lie in pairs at opposite poles of the cyst. Fairly frequently the cysts contain in addition to the nuclei one or two or more rods of a homogeneous highly refractile substance, which go by the name of the chromidial bodies, and, further, there may be a large vacuole in the cytoplasm. If only a single cyst is seen it may be difficult to diagnose with certainty, but a single fresh cover-glass preparation will often contain 50 or more, so that a definite opinion can easily be arrived at.

As in the case of *E. coli* the cysts are responsible for the spread of infection, so that an individual who has recovered from an attack of dysentery, but who is still harbouring the small amœbæ which are producing the cysts, is a carrier who is far more dangerous to the general public than an individual who is actually suffering from true amœbic dysentery. Apparently carriers may maintain their infections for long periods, during which time they are constantly passing cysts, sometimes in enormous numbers, and certainly spreading the infection in this manner. In a place like Gallipoli such infective cysts may be spread by any agent which will distribute them such as flies, water, wind, and possibly also dust. Fortunately, a simple microscopic examination of the fæces, as explained above, will detect the condition, and a treatment by emetine injections will almost certainly get rid of it. On several occasions I have produced typical and fatal amœbic dysentery in cats by administering fæces obtained from such carriers of infection, who have shown at the time no signs of amœbic dysentery.

Amœba limax (*Wahlkampfia limax*) (Figs. 45–47).

In addition to the two common amœbæ described above there occurs sometimes in the large intestine of man a small amœba about 10 microns in diameter. It resembles very closely free-living water amœbæ of the *Amœba limax* type, and it may be one of these present in the gut accidentally. Encysted forms of free-living amœbæ, which are almost as widely distributed as bacteria, are being constantly eaten with food, and it is supposed that under certain conditions not at present understood the amœbæ escape from the cysts in the large intestine and there multiply. As a rule, however, the cysts pass unchanged through the intestine. These amœbæ are recognised from the true entamœbæ by their small size and the character of the nucleus, which is a spherical body enclosing a very large central karyosome. Many attempts have been made to obtain cultures of *E. coli* and *E. histolytica* by inoculating various media with fæces containing them, and in certain cases cultures of amœbæ have been obtained, but the amœbæ in the cultures always have the characters of the small "limax" amœbæ and not those of the entamœbæ. It is probable that the cultures obtained, as I pointed out so long ago as 1907, and as has recently been conclusively demonstrated by Walker in the Philippines, have originated, not as supposed from the entamœbæ, but from the small "limax" amœbæ or their cysts, which have been undetected and accidentally present in the inoculated material.

In the large intestine these small "limax" amœbæ have no pathogenic significance and are recognised from the entamœbæ chiefly by their small size. They are, however, difficult to distinguish from certain intestinal flagellates which have become rounded and changed after having left the body for some hours, and furthermore it seems certain that flagellates belonging to the genera *Cercomonas*, *Bodo*, and *Prowazekia* have an amœboid stage which is indistinguishable from a typical *Amœba limax*.

Trichomonas Intestinalis (Figs. 20–26).

Of all the intestinal flagellates of man this is by far the commonest. It lives in the large intestine and cæcum, where it occurs sometimes in enormous numbers and varies very considerably in size. It has a pear-shaped body varying in length from about 5–15 microns. At the blunt anterior end of the body is a spherical nucleus, just anterior to which is a chromatin granule from which arise three long free flagella which are directed forwards, and a fourth thicker flagellum which passes backwards in a slightly spiral manner attached to the border of an undulating membrane, beyond which it is continued at the posterior end of the animal as a free flagellum. Near the nucleus at the anterior end is a slight conical depression, the cytostome. Running along the base of the undulating membrane and arising from the granule from which the flagella spring is a stiff rod which may function as a stiffening rib for the membrane. Another structure, the axostyle, arises near the cytostome in the nuclear region. It is a clear refractile bar, which is continued through the body towards the posterior end, where it protrudes through the surface as a sharp point. The cytoplasm of the body is often vacuolated, and within the vacuoles are bacteria which appear to be ingested as food.

In the fresh condition the flagellates progress rapidly by vigorous lashing movements of the three anterior flagella, while the undulations of the membrane and the movements of the attached flagellum cause it to revolve on its longitudinal axis. The movements may be so rapid that the study of the organism is difficult. After some time the movements slow down, and then with the 1/6 or 1/8 inch objective the characters can be easily seen. Often when a preparation has been first made no flagellates are visible, but after a while they are seen to wriggle out of the thicker portions into the more open parts or streams of liquid, in which they swim about very rapidly. As they revolve the undulating membrane becomes visible when it is directed upwards. Even then

some difficulty may be experienced in seeing clearly the anterior flagella, which are very fine structures. This difficulty can easily be remedied by examination with the dark-ground condenser, for then not only are the flagella clearly visible, but all the movements of the flagellate are beautifully seen. It is important to count the three anterior flagella, for it is only by this means that one can distinguish the *Trichomonas* from two other closely allied though much rarer forms—the *Tetratrichomonas*, which only differs in the possession of four anterior flagella, and the *Pentatrichomonas*, which has five.

Reproduction of the flagellate is by longitudinal division. The nucleus divides, the granule from which the flagella originate divides, a new undulating membrane is formed and a new stiffening rod grows out from the divided basal granule. The body of the flagellate with all the organs duplicated then splits, giving rise to two daughter individuals. There is some doubt as to the reproduction of the axostyle, as some maintain that a new one is formed in each individual after absorption of the original one, while others think it divides longitudinally into two. As with the entamœbæ, the rate of successive divisions determines the size of the flagellate.

Trichomonas will survive for days after removal from the body, and even when none can be seen at first they will reappear after warming the fæces. They change in two ways; some of them degenerate by casting off and losing the various structures they possess, others without any such loss become spherical and motionless, and these, when warmed, will resume active life again. They are resistant bodies and will withstand the action of gastric juice for a considerable time, so that it appears probable that it is such contracted spherical forms which are responsible for the spread of infection, especially when it is remembered that definitely encysted forms are not known.

Those Trichomonas which lose their various organs do so fairly regularly, and they assume a series of forms which may cause some confusion if not recognised. The first change is usually a breaking loose of the flagellum attached to the undulating membrane. (Fig. 23.) It remains fixed at its point of origin, so that one has the appearance of an organism with one large thick flagellum and three finer flagella. The region of the membrane still shows undulating movements. A further stage is the casting off of the large flagellum and the disappearance of the three finer anterior flagella. There is thus produced an irregular and constantly changing mass of cytoplasm, which still exhibits at one edge an undulating movement. (Fig. 24.) These forms look like amœbæ with an undulating border, and it was undoubtedly these which led Castellani to describe the *Entamœba undulans* of the human intestine. Sometimes a peculiar movement is seen. At one end a long finger-like pseudopodium is suddenly thrown out. It moves backwards along one edge, getting shorter as it does so, till it completely disappears at the other end. Another one is at once formed, and the process is repeated at intervals of one or two seconds. (Fig. 25.) Finally, it becomes a motionless mass of cytoplasm which is difficult to distinguish from a small limax amœba.

As regards the pathogenicity of *T. intestinalis* very little is known. The mere discovery of them in large numbers in diarrhœic conditions affords little evidence, as it is these very conditions which seem to favour their multiplication. It does not seem that in man infections are of long duration, for they have quickly disappeared from the stools of individuals I have had under observation, and in this respect stand in marked contrast to infections with *Lamblia intestinalis*, *E. coli*, and *E. histolytica*, which appear to persist indefinitely. *Trichomonas* of the same or an allied species is often found in vaginal discharges. It seems most reasonable to assume this to be an invasion from the gut though the organism, which is larger than *T. intestinalis*, is generally given the distinctive name of *Trichomonas vaginalis*. One must always bear in mind the great variation in size of all the intestinal Protozoa.

Trichomonas is very common in rats, mice, fowls, and other animals. Dr. A. C. Stevenson has shown me a section of the cæcum of a mouse in which there is a definite lesion of the mucous surface, which is being invaded by numerous *Trichomonas*. If such invasion can occur, probably through a surface broken by some other infection, or irritant such as sand, it is possible that the flagellates might aggravate the lesion or produce definite symptoms.

Escomel, working in South America, claims to have cultivated *Trichomonas* from cases of diarrhœa and to have produced infection with diarrhœa in dogs by injection of these cultures. Furthermore, he has claimed to have discovered the flagellate in the drinking water and that after clearing the reservoirs they were no longer found, while the dysentery ceased to be prevalent. This interesting work needs confirmation.

Lamblia Intestinalis (Figs. 1–8).

This flagellate is of fairly common occurrence and differs from other Protozoa of the human intestine in that it lives in the upper part of the small intestine. In shape it resembles a pear split into two parts along the longitudinal axis. There is a flat surface on which there is a sucking disc with raised edge and a convex surface. The tapering extremity or tail can be turned over the convex back and it terminates in two flagella. There are three other pairs of flagella, the arrangements of which are best seen by referring to the plate. All four pairs of flagella originate in a paired rod-like organ occupying a central position in the flagellate. In stained specimens this paired rod-like structure can be resolved into a series of fibres and granules of a complicated nature, as shown in the diagram. (Fig. 2.) Two nuclei are present, one on each side of the rods, and these give the organism when viewed on the flat surface a curious face-like appearance. The flagellate swims rapidly and on account of its shape moves about with a swaying motion in a manner reminding one of a flat-fish swimming in a tank of water. In the intestine it is able to rest on the surface of the epithelium with the flat, sucker-like disc applied to the cells and with its tail turned up over its back. Judging from the appearances I have seen in sections of the intestine of rabbits infected with *Lamblia* it would seem that the *Lamblia* invade the digestive glands of the mucous lining of the gut, where they can sometimes be seen sitting on the glandular epithelium in rows.

Lamblia intestinalis varies in length from about 12 to 18 microns, and on account of its characteristic appearance there is little difficulty in recognising it. It does not survive any length of time after escape from the body. At first very active, the movements gradually subside and consist only in

lashings of the flagella. These gradually cease moving, but the two larger central flagella can often be observed gently undulating long after all other signs of life have disappeared.

Reproduction of *Lamblia* appears to take place only in the encysted condition. I have never seen an unencysted dividing *Lamblia*, though I have observed these organisms constantly for many years. Multiplication takes place in a cyst, which is formed in the upper part of the small intestine. The cyst, which is formed round a single *Lamblia*, is an oval structure about 14 microns in length. It is quite transparent like the cysts of the *Entamœbæ*, so that the *Lamblia* can be seen within it. Within the cyst certain changes of a very complicated nature take place. Firstly, the two nuclei migrate to one end of the cyst and there divide, so that a total of four are present. (Figs. 5 and 6.) The complicated flagellar apparatus is duplicated and two nuclei migrate to the opposite end of the cyst. The contents of the cyst divide to form two *Lamblia*, which can be seen in the cyst with the oblique line of separation between them. (Fig. 7.) Apparently, if reproduction has proceeded thus far while the cyst is still in the small intestine it ruptures and the two daughter *Lamblia* escape and help to maintain the infection of the small intestine. If, on the other hand, the cyst has passed into the large intestine before complete development has taken place it ceases to develop further and is passed out to the exterior, where it awaits ingestion by a new host. If it gains entrance to the intestine of such a host the development is completed, and two *Lamblia* escape and bring about infection of the small intestine. The cysts of the *Lamblia* thus serve the double purpose of reproduction within the host and transmission of infection from one host to another. It is possible that two types of cyst exist, but the account I have given seems to be the simplest explanation of the appearances I have observed.

Individuals infected with *Lamblia intestinalis* often discharge encysted forms in the fæces in enormous numbers, and only pass the free-living flagellates if they have attacks of diarrhœa. *Lamblia* infection can easily be recognised by the finding of the characteristic cysts in the fæces. These are, as already explained, oval structures. With careful focusing with the 1/12 inch oil immersion lens the nuclei, two or four in number, at one end of the cyst can be detected, while the two longitudinally arranged rods from which the flagella originate in the free flagellate give the appearance of a faint longitudinal striation. Within the cyst the line along which the cytoplasm touches the cyst wall often has a characteristic wavy appearance. In examining for *Lamblia* cysts it must not be forgotten that if the cyst is standing on end it will appear circular in outline and might then be mistaken for other structures. The addition of iodine solution renders the contents of the cyst more prominent.

Lamblia intestinalis is a very persistent flagellate. I have had under observation two or three persons who have maintained their infection for years. One of these has an enormous infection and sometimes passes cysts in such numbers that as many as a dozen or more can be seen in a field of the 1/12 inch objective. Many attempts have been made to get rid of this infection without result, but during the whole of this time there have been no signs of intestinal derangement. In other cases there occur at intervals attacks of diarrhœa with the passage of mucus in which *Lamblia* are to be found in enormous numbers, so much so that the whole microscopic field is packed with them. After recovery from such an attack the stools become normal again and only encysted forms are to be found. The occurrence of repeated attacks of this nature with a certain degree of abdominal uneasiness preceding the attacks and the passage of such extraordinary numbers of the flagellates especially in the mucus leads me to suspect that sometimes, at any rate, *Lamblia intestinalis* may produce sufficient irritation of the small intestine to justify us in regarding it as pathogenic. The invasion of the glands of the small intestine as seen in the rabbit is suggestive of such a pathogenic rôle.

In the way of treatment injections of emetine apparently have no effect. A case recently came under the notice of Dr. G. C. Low and myself. It was a man who was a carrier of *E. histolytica* and *Lamblia intestinalis*. He was passing large numbers of cysts of both kinds. He was treated by injections of emetine, which had the effect of completely ridding him of his entamœbic infection but had no effect on the *Lamblia*. Subsequent treatment with large doses of β-naphthol reduced the infection but failed to get rid of it; β-naphthol, however, appears sometimes to destroy a *Lamblia* infection of the intestine. Another case of *Lamblia* infection was treated by doses of emetine in capsules by the mouth, also without result. This case again failed to respond to treatment with β-naphthol. The somewhat drastic treatment adopted for the destruction of *Ankylostoma duodenale* in the duodenum has also failed to destroy completely the *Lamblia* in the small intestine. It is possible that the forms in the cavity of the gut come under the influence of the drug, while such as are lurking in the tubular glands escape entirely, and are responsible for the re-establishment of the infection after treatment has ceased.

Tetramitus Mesnili (*Macrostoma Mesnili*) (Figs. 9–19).

This is a flagellate which was first found by me a few years ago in the intestine of a man who had come to London from the Bahamas. He had been admitted to the Albert Dock Hospital for some chest complaint, and the flagellate was only discovered in the course of routine examination.

In general shape, size, and the possession of three long fine anterior flagella it resembles *Trichomonas intestinalis*. It differs, however, in having no undulating membrane and no axostyle. It has, on the other hand, a large cytostome in the form of a longitudinal slit, which runs from the anterior end along half or two-thirds of the body length. The cytostome has a sharp margin which is sometimes produced into lips which appear to overlap one another. (Fig. 9.) Within the cytostome is a longitudinal flagellum, which seems to be attached to the border of an undulating membrane. (Fig. 10.) The cytostome flagellum and the three anterior flagella all arise from a granule which lies just anterior to a spherical nucleus near the anterior end of the cytostome. The posterior end of the animal is pointed and may sometimes be drawn out to a length equal to, or greater than, that of the body itself. The cytoplasm is generally very vacuolated and contains bacteria, which seem to be the staple article of diet. The size of the flagellate varies considerably, there being minute forms 3 or 4 microns in length, and every intermediate gradation up to individuals with a length of about 15 microns.

There seems to be some doubt as to the method of reproduction of *Tetramitus mesnili*. I have never seen an undoubted dividing form in a stained film, but some such method of multiplication must occur, and the presence in fresh preparations of specimens with two tail-like prolongations may be an indication of multiplication by simple longitudinal division such as occurs in the case of *Trichomonas*.

Encysted forms of *Tetramitus* are produced in the shape of oval transparent cysts 7 to 8 microns in length. (Fig. 15.) Within the cysts the characteristic features of the *Tetramitus* can be seen. The future of these cysts is probably escape from the body and transmission of infection to other individuals, as with so many of the intestinal Protozoa. In some preparations I have seen cysts in which a single nucleus has divided twice to produce four nuclei, so that it seems probable that after encystment multiplication takes place within the cyst. (Fig. 17.) The development of the cysts of *Tetramitus* and its method of multiplication within the gut require further study.

Tetramitus mesnili is readily seen with the 1/6 objective. It can most easily be confused with *Trichomonas*, though the undulating membrane of the latter and the large cytostome of the former should prevent such an error. The counting of the three anterior flagella offers the greatest difficulty, and, as with *Trichomonas*, they are most clearly seen with dark-ground illumination. This method of observation also affords the clearest view of the movements of the flagellum within the cytostome—a flagellum which is so difficult to detect with ordinary transmitted light that some have even denied its existence.

Like other flagellates of the intestine the activities of *Tetramitus mesnili* are greatest in fæces which have been freshly passed. Soon the movements become less active and finally cease completely. *Tetramitus* survives in fæces only a few hours, and in this respect is quite unlike *Trichomonas*, which may survive for days. The normal pear shape of the organism is quickly lost and all kinds of distorted forms soon appear. (Figs. 11 and 12.) Some lose their flagella and contract till they are mere spherical masses of cytoplasm, which are then practically indistinguishable from the spherical forms of *Trichomonas* or of small amœbæ of the limax type. It is possible that this assumption of the spherical form has to do with an attempt at encystment, but the actual encystment of such forms has not been observed.

Tetramitus mesnili was first discovered by me in a man with no intestinal symptoms. Since then it has been found to have a very wide distribution in tropical and sub-tropical countries, and certain small epidemics of diarrhœa have been attributed to this flagellate. In all these cases in which *Tetramitus* and, indeed, all intestinal parasites are present, the greatest care should be undertaken to exclude all bacterial infections such as typhoid, paratyphoid, dysentery, &c., for the very gut conditions produced by these bacteria may be the cause of inducing an active multiplication of perfectly harmless flagellates.

Cercomonas, Bodo, Prowazekia (Figs. 41–44).

There are three other flagellates which should be mentioned as they occur, though in my experience very rarely, in the human intestine. These are species of *Cercomonas*, *Bodo*, and *Prowazeka*. It is doubtful if they are true parasites like the flagellates described above, for they correspond very closely and are possibly identical with free-living forms which are often to be found in wet, decomposing material. They will often appear in fæces which have been kept a few days, though they could not be detected in the freshly passed fæces. They are all three slightly elongated flagellates up to 15 microns in length, with a blunt anterior end and a tapering posterior end. They each possess two flagella, one of which is directed forwards in movement, while the other trails backwards. Both flagella take origin at the blunt anterior end of the body. In both *Bodo* and *Prowazekia* (Figs. 42 and 43) the two flagella are free, while in *Cercomonas* (Fig. 41) the trailing or backwardly directed flagellum is attached to the surface of the body as far as the posterior end of the flagellate, when it is continued as a free flagellum. *Cercomonas* and *Bodo* have each a single nucleus, consisting of a nuclear membrane and large central karyosome. The flagella appear to take origin from the nuclear membrane. In *Prowazekia* (Fig. 43), on the other hand, there are two nuclei, from one of which the flagella arise. The general structure of these flagellates will be seen on the diagram.

The three flagellates just described have probably no pathogenic significance whatsoever, and are to be regarded as free-living forms which have taken up a temporary abode in the gut. They are very readily cultivated on agar or liquid media in which bacteria are growing and there may become encysted in small spherical cysts 6 to 8 microns in diameter. (Fig. 44.) They probably all have an amœboid stage indistinguishable from *Amœba limax*. The cysts are probably responsible for the occasional appearance of the flagellates in the intestine of man, for cysts of these forms constantly pass through the intestine, and it is the flagellates which escape from these cysts in fæces that are kept for a few days which give rise to the cultures of flagellates. Like the small limax amœbæ described above, they may occasionally escape from their cysts while they are still in the large intestine, and thus give rise by rapid multiplication to a temporary infection of the gut.

That these forms are of rare occurrence is shown by the fact that only in one case in ten years' experience of examinations for intestinal Protozoa have I come across undoubted *Cercomonas*. I must make one remark about the name *Cercomonas*, which is used very loosely in medical literature. It has become a habit with some to call any actively moving flagellate seen in fæces a *Cercomonas*, quite regardless of the fact that the true *Cercomonas* is a flagellate of very definite structure. In the diagnosis of intestinal flagellates it is absolutely essential to see clearly the structure and number of flagella, for without these data it is impossible to arrive at a clear idea of which flagellate one is dealing with. To one experienced in the examination of such organisms the ordinary transmitted light will be sufficient, but, as already mentioned above, the dark-ground illumination is a great help. Staining may be of some assistance, and I will give at the end of this paper some general directions for carrying out this process for intestinal Protozoa.

Balantidium Coli (Figs. 54 and 55).

This protozoon is a member of the group Ciliata, and is the only common ciliate of the human intestine. It appears to be a normal inhabitant of the intestine of pigs, and those who have to deal with these animals are most liable to infection. It inhabits the large intestine of man, and has the

power of boring its way into the mucous coat and producing extensive ulceration, very much as *E. histolytica* does. It is sometimes found in the mesenteric glands draining the ulcerated areas. The condition produced by this ciliate is known as balantidial dysentery.

Balantidium coli is a large organism varying considerably in size, according to Brumpt. Its length may be anything from 30 to 200 microns and its breadth 20 to 70. On an average it is about 50 to 100 microns in length. It is thus a much larger organism than any of the other intestinal Protozoa. It has an ovoid body which is slightly narrower at the anterior than at the posterior end. There is a cytostome opening at the anterior end; the whole body is covered with longitudinal rows of cilia which are longest around the cytostome. There is a large nucleus which is usually elongated and slightly curved (horseshoe-shaped), the macronucleus and a smaller nucleus, the micronucleus, which is generally hidden in a depression in the macronucleus. There are present in the cytoplasm two contractile vacuoles which pulsate at intervals, while there occur a varying number of food vacuoles of different sizes. Food is taken in through the cytostome and passes into vacuoles in the cytoplasm, where digestion takes place. Undigested particles of food are thrown out from the posterior end of the animal at the anus, which is only visible at the moment of extrusion of any particle.

These large ciliates swim about amongst the intestinal contents by means of their cilia, while the anterior narrower end exhibits a certain amount of change of shape as if the creatures were feeling their way through the débris. Multiplication both in the gut cavity and in the invaded tissues takes place by transverse division, the nucleus first dividing into two parts. When multiplication is proceeding rapidly there may result small individuals not more than 30 microns in length, as Brumpt has shown in the case of experimental infection in monkeys.

As with other intestinal Protozoa, cysts are produced, which are responsible for the infection of new individuals. According to Brumpt, these cysts may be formed round single *Balantidia*, or two may enter a single cyst. In the latter case a conjugation takes place by fusion of the two ciliates. The cysts of *Balantidium* are roughly spherical or oval structures about 50 to 60 microns in diameter; they can be recognised by the ciliated organism within.

Balantidium coli is such a large and characteristic organism that there can be no difficulty in

DESCRIPTION OF PLATE.

All the figures have been drawn to one scale (shown at bottom of Plate) with the exception of Figs. 54 and 55, which are only half the size they should be. An ordinary human red blood corpuscle on same scale is shown at Figs. 48 and 56 for comparison.

Lamblia Intestinalis (Figs. 1–8).

1. Surface view showing sucking disc, two nuclei, and eight flagella.
2. Origin of flagella as seen in stained preparations. They are represented as being more spread out than is actually the case.
3. Side view of thick form.
4. Side view of narrow form.
5. Encysted form with two nuclei.
6. Encysted form with four nuclei.
7. Encysted form containing two flagellates.
8. Appearance of cyst when viewed on end. The cysts are sometimes shorter in proportion to their breadth and much more definitely egg-shaped, with one end slightly narrower than the other, than represented in the plate.

Tetramitus Mesnili (Figs. 9–19).

9. Form with overlapping lips of cytostome.
10. Form showing flagellum in cytostome.
11. Form in which posterior filamentous extremity is retracted.
12. Still further retracted form.
13. Rounded form in which flagella are lost so that the resemblance to a small amœba is marked.
14. Very small form of normal shape.
15. Encysted form with single nucleus and cytostome visible.
16. Very small round form.
17. Possibly encysted form with four nuclei.
18. Intermediate form of normal shape.
19. Appearance of flagellate when viewed on end, the cytostome with the incurved lips shown clearly, as also the flagellum within.

Trichomonas Intestinalis (Figs. 20–26).

20. Flagellate of normal structure; the three flagella appear to have a common base, possibly due to their being twisted round one another.
21. Flagellate of normal structure; the three flagella are free in their entire length.
22. Rounding off form with undulating membrane running round margin.
23. Degenerating form; the large flagellum has broken loose from the undulating membrane, so that the flagellate has the appearance of having one large and three smaller flagella.
24. Further degeneration; the flagella and axostyle are lost, so that the appearance is of an amœba with undulating border.
25. Amœboid form throwing out the finger-like pseudopodium, which rapidly passes down side of body into dotted positions, where it disappears.
26. Detached flagellum.

Entamœba Coli (Figs. 27–32).

27. Small entamœba of roughly spherical form and vacuolated cytostome.
28. Small entamœba forming pseudopodium with no distinction between ecto- and endo-plasm.
29. Large entamœba of irregular shape.
30. Large entamœba with slit-like rectangular vacuoles.
31. Encysted form as it appears in the fæces. This is the form most commonly observed and which is most useful for diagnostic purposes.
32. Encysted form of abnormal type with large central vacuole. In other cases there may be several vacuoles, and the vacuolation has the effect of retarding nuclear division, as such forms usually have only two, or possibly four, nuclei.

In *E. coli* infections it is generally only the completely developed cyst with eight nuclei which is passed in fæces. The earlier stages of development with one, two, and four nuclei take place in the large intestine before the cysts escape.

Entamœba Histolytica (Figs. 33–40).

33. Large tissue-invading form ("tetragena" form) containing five red blood corpuscles.
38. Large tissue-invading form with ectoplasmic pseudopodium and containing two red blood corpuscles.
39. Small form of intermediate size with ectoplasmic pseudopodium.
40. Small "minuta" form as seen in post-dysenteric conditions.
34. Encysted form with four nuclei, chromidial body, and vacuole.
35. Encysted form with four nuclei. It is distinguished by its smaller size from the four-nuclear stage of *E. coli*, which, however, is rarely passed in the fæces.
36. Encysted form with one nucleus and chromidial body.
37. Encysted form with two nuclei and two chromidial bodies.

The encysted forms begin to appear as the acute dysenteric symptoms subside, and are thus very characteristic of the infection in carrier cases. It is important to note that they are much smaller than the cysts of *E. coli*. In *E. histolytica* infections it is usual to find passed in the fæces cysts in all stages of development.

Cercomonas, Bodo, Prowazekia (Figs. 41–44).

41. Cercomonas. The backwardly directed flagellum is adherent to the body. There is only a single nucleus.
42. Bodo. The two flagella are free and there is only a single nucleus.
43. Prowazekia. The two flagella are free and there are two nuclei.
44. Encysted form of either of above three flagellates.

Amœba Limax (Figs. 45–47).

45. Form without pseudopodium and characteristic "limax" nucleus.
46. Form with pseudopodium.
47. Encysted form.
48. Red blood corpuscle to show relative size of objects in plate.

Blastocystis Hominis (Figs. 49–53).

49. Large spherical form with several nuclei in semilunar protoplasm at opposite poles.
50. Somewhat triangular form with many nuclei.
51. Small oval form.
52. Small elongated form.
53. Elongated dividing form.

This organism is of a vegetable nature, but under certain conditions degenerating flagellates and small amœbæ or the encysted forms of these, by the development of a large central vacuole, will closely simulate the true Blastocystis.

Balantidium Coli (Figs. 54–55).

54. Free ciliate as it lives in lumen of gut and in tissues.
55. Encysted form containing two ciliates as passed in fæces.
56. Red blood corpuscle as in Fig. 48.

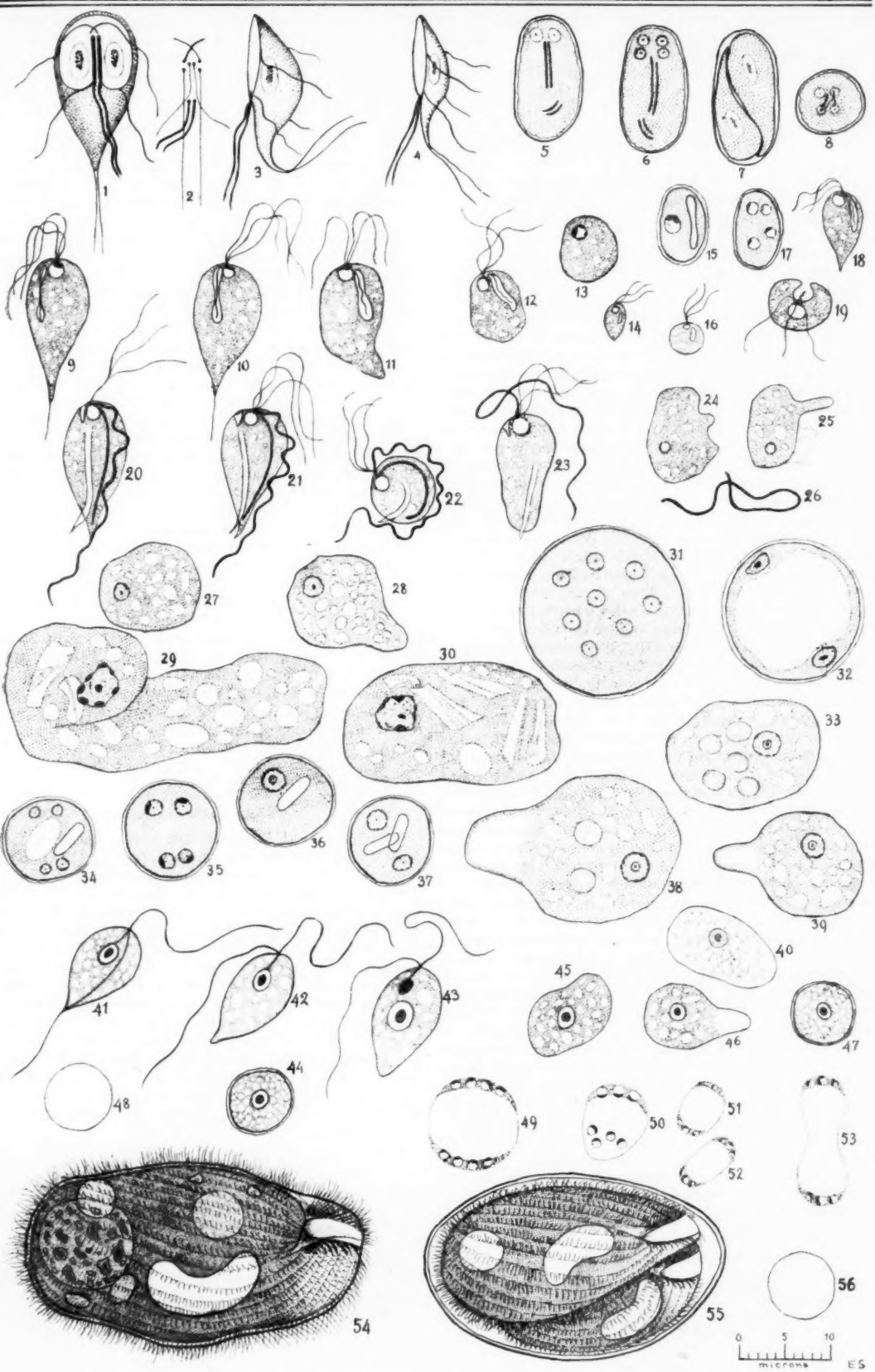


Plate illustrating Dr. C. M. Wenyon's article on Intestinal Protozoa of Man.

its recognition. It might possibly be confused with ciliated embryos escaping from worms' eggs if careful observation is not made.

Other ciliates have been met with in the intestine of man, but many of these are only accidental infections with ciliates which usually live in water and are in no way parasitic. A small ciliate measuring 20 to 30 microns in length was described by Schaudinn from the human intestine under the name of *Balantidium minutum*. It has the same general structure as *Balantidium coli*. Another described by the same author is *Nyctotherus faba*, a ciliate with a lateral instead of a terminal cytostome. Both of these ciliates are of rare occurrence and are probably of no pathological significance.

Blastocystis Hominis (Figs. 49–53).

The description given above includes all the Protozoa which are likely to be encountered in the intestines of people returning to this country from tropical or subtropical countries, but it must be remembered that fæces contain vegetable cells, yeasts, and other bodies which must not be confused with encysted Protozoa. One such organism of a vegetable nature is known as *Blastocystis hominis*. It is a more or less spherical structure which varies in diameter between 5 and 15 microns, and may fairly readily be mistaken by the inexperienced for encysted *E. coli* or *histolytica*. The Blastocystis is a very much more flimsy structure with more delicate capsule than the cysts of Entamœbæ. The great part of the cyst content is a large vacuole which reduces the cytoplasm to a narrow rim at one or often two poles of the cyst. In this narrow, greenish rim of cytoplasm are to be seen a varying number of refractile, greenish spots which are really nuclei. These spherical Blastocystis may become elongated and divide transversely into two parts. Alexeieff regards them as vegetable organisms allied to the yeasts. Sometimes they occur in enormous numbers in the stool—hundreds being present in an ordinary field of the 1/6 inch objective. Some have regarded them as cysts of *Trichomonas*, but in my experience this view is not tenable, for I have encountered them on so many occasions in large number when there was no trace of *Trichomonas*. It is quite possible, however, that under certain conditions such a structure as the spherical cyst of a small limax amœba, by developing abnormally a large central vacuole, such as occurs occasionally in the cysts of *E. coli*, may come to resemble a true Blastocystis. On occasions it has seemed to me that degenerating *Trichomonas* or *Tetramitus* may become centrally vacuolated and resemble Blastocystis, and in this connexion it is interesting to recall that Dobell thought that similar structures which he encountered in the intestines of frogs had been derived from degenerating red blood corpuscles of these animals. However this may be, there is a true Blastocystis which can multiply by division into two parts or occasionally by multiple division as claimed by Alexeieff, and it is these forms which, being exceedingly common in the human intestine, especially of those who have lived in warm climates, must be carefully distinguished from encysted Protozoa.

Coccidiosis.

Dr. H. M. Woodcock[2] has called attention to certain bodies he had found in the fæces of some of the cases from Gallipoli. These were elongated cysts containing one or two masses of protoplasm. He considered them to be oöcysts of a Coccidium and thought they were related to the Isospora. He was unable to obtain any further development of the bodies so that their coccidial nature was unproved. Since Woodcock's paper appeared Dr. G. C. Low has come across one case and I have seen three others at the London Hospital. In the fæces of one of these kept at the laboratory temperature the cysts have completed their development in three to four days. The single mass of a protoplasm contained by the young cysts divides into two sporoblasts, which in their turn become enclosed in oval sporocysts. Within the sporocyst each sporoblast now divides into four sporozoites and a large residual body, so that the fully developed oöcyst contains two sporocysts, each of which contains a residual mass of cytoplasm and four sporozoites. The oöcyst when first found contains the single mass of protoplasm. The wall of the oöcyst shows a marked double contour and within what appears to be a fine lining membrane. One end of the oöcyst often shows a narrowing just before the end is reached, and at this end there is some indication of an opening, a micropyle through which in all probability the male gamete enters to effect fertilisation. The micropyle is sometimes seen covered on the inner surface by a plug. The development, which I have followed, proves that Woodcock's conjecture was correct, and that these structures are really coccidia and belong to the genus Isospora, one member of which is a parasite of the intestines of cats and dogs, and another of the kidneys of frogs. As the coccidium develops in the intestinal epithelium it, of course, brings about destruction of the epithelial cells themselves, and so must be regarded of some pathogenic importance, although the symptoms of human intestinal coccidiosis have not been definitely determined. In animals such infections are often the cause of serious enteritis, which may have a fatal termination.

Methods of Examination.

The intestinal Protozoa are best examined fresh and living and so soon after leaving the body as possible. The encysted forms protected by the cyst do not change and can be satisfactorily studied days after they have been passed, but the unencysted motile forms quickly change and degenerate, so that after some hours it may be a matter of great difficulty to identify them. As I have already remarked, it is better to examine several thin preparations of diluted fæces than one thick one, and if the fæces are perfectly fresh there is no necessity to use a warm stage, which may even be a disadvantage in causing the flagellates to move too rapidly for satisfactory observation. If the fæces are old a warm stage may revive amœbæ or flagellates which have ceased to move and thus help diagnosis.

Practically all details of structure which I have described above can be seen in the living forms, and there is no need to prepare stained preparations for this purpose. Great assistance in the diagnosis of flagellates is derived from the use of the dark-ground illumination.

Another point worthy of note is that the Protozoa degenerate much more rapidly if the fæces be kept warm in an incubator. It is probably due to the more rapid action of the bacteria at higher temperatures. Accordingly, if it is impossible to examine a

[2] Brit. Med. Jour., Nov. 13th.

specimen at once it is better to preserve it in the cold, and only warm it on the stage at the time of observation.

Often in dealing with the encysted forms of Protozoa in fæces it will be found that the nuclei within the cysts are difficult to distinguish. This is especially the case with the cysts of *E. histolytica* or *Lamblia*. The following method will be found useful in bringing the nuclei into greater prominence. A small drop of iodine solution (Weigert's solution = iodine 1, potassium iodide 2, distilled water 100) is placed on a slide and some of the fæces to be examined is rubbed in it by means of a match or platinum loop to give a yellow emulsion. A cover-glass is placed on it and the preparation examined at once. The cysts are stained a light-brown colour, and the nuclei, which may have been invisible before, now stand out clearly and can readily be counted.

If it should be desired to make permanent stained preparations the most satisfactory results are obtained by using some method of wet fixation. Ordinary dried smears stained by Giemsa stain will sometimes give fairly good pictures of the flagella of *Lamblia* or other flagellates, but, as a rule, so much distortion takes place that it is almost impossible to recognise the organisms.

The following method has given me very good results. A thin smear of the fæces, diluted if necessary, is made on a cover-glass and this is dropped without drying, film side downwards, on to a fixing fluid. A very good one consists of a mixture of 2 parts of saturated watery sublimate and 1 part of alcohol. The cover-glasses float on the surface of the fixative and are allowed to remain there for 20–30 minutes. They are then carefully removed and placed in a Petri dish of 30 per cent. spirit (this time film side up) in order to remove the sublimate. Great care must be taken to prevent them scraping against one another. After a few minutes' washing in this manner in several changes of the alcohol they are placed in distilled water and are ready for staining, and are to be treated as if they were sections. The best results are obtained by staining with iron hæmatoxylin. The films are left to soak for some hours (during the day or over night) in a 4 per cent. solution of iron alum. They are then washed for a second or two in distilled water and placed in Heidenhain's hæmatoxylin, in which stain they become quite black. They are left there for several hours as before. The black films are then washed in distilled water and placed in a 1 per cent. iron alum solution, which commences to dissolve the black stain. The differentiation must not be carried too far, and in order to control it the films must be examined every few minutes in distilled water with a water immersion lens or with the ordinary 1/6 objective. The success of the method depends on the right degree of differentiation, and in examination of the films it is essential to see the actual objects which are being stained, for objects vary in the amount of extraction required. The nuclei should show clearly as black rings. Experience alone can teach the right degree of extraction of the stain. As a rule, a flagellate film should not take longer than 5 to 10 minutes for differentiation in 1 per cent. iron alum solution. Objects like encysted forms, of course, take longer. When differentiation is complete the films are washed in distilled water and taken up through strengths of alcohol to absolute alcohol. They are then cleared in xylol and mounted in balsam. By this method of fixation and staining permanent preparations are obtained while the actual shape and structure of the organism are preserved and often every detail can be readily seen.

It is essential to have constantly at hand an eyepiece fitted with a micrometer scale, the size of the divisions of which is known in microns for each power of the microscope and for a definite tube length. If any object, as for instance a cyst of *E. coli*, is found, its size can at once be determined by inserting the micrometer eyepiece. The actual size of the divisions of the eyepiece scale is discovered by examining with this eyepiece the micrometer slide, on which a scale in tenths and hundredths of a millimetre is marked. It will be found that each division of the eyepiece scale with the 1/12 inch objective represents, say, 1·7 microns, and this is a constant factor which can be used at a moment's notice. With lower powers the value of each division will be correspondingly greater. It is much better to have a special eyepiece for this purpose so as to obviate the necessity of inserting the scale when required.

In the above description I have given an account of the common Protozoa of the human intestine as I have seen them in the course of many years' observation, and it is hoped the description will be of some assistance not only to those who deal with the examination and treatment of cases in Egypt, Mudros, the Peninsula, and Mesopotamia, but also to others having under their care men in this country who have returned from localities where these infections are likely to be contracted. I have recently seen a good many instances of protozoal infections of the gut in cases returning from Gallipoli in hospitals both in London and the provinces. *E. coli* is very common in these men, and also the flagellates *Trichomonas*, *Tetramitus*, and *Lamblia*. No case of *Balantidium* infection has come under my notice, but one case has been recorded recently in Egypt. On the other hand, the vegetable organism *Blastocystis* occurs in large numbers in these cases, while occasionally I have seen a small amœba of the limax type. I have seen only four cases of *E. histolytica* infection, and this is all the more gratifying, for I hear from Lieutenant-Colonel A. Balfour that such infections are far from uncommon out there, but that they are in most cases immediately cut short by suitable treatment with emetine. This speaks well for the wonderful action of this drug in killing off the pathogenic entamœba and so preventing that formerly too common sequel of the disease, amœbic abscess of the liver.

THE LATE DR. JOHN H. DAUBER.—It has been thought desirable to raise a Memorial Fund to perpetuate the memory of Dr. J. H. Dauber, an obituary notice of whom has appeared in our columns. He lost his life in the sinking of the transport ship, *Royal Edward*, on the way to the Dardanelles in August last. The authorities of the Soho Hospital for Women (where Dr. Dauber had served as a member of the honorary medical staff for upwards of 20 years) have been consulted with a view of ascertaining the best way to carry out the wishes of his family and friends. Dr. Dauber was for many years lecturer to the nursing staff at this hospital, and the training of the nurses on the theoretical side of their work was entrusted entirely to him. It has been decided to institute a fund in connexion with the hospital, to be called "The Dr. Dauber Memorial Nurses' Prize Fund." It is hoped to raise a sum of about £250, the income from which, when invested, would be applied yearly in distributing prizes to the members of the nursing staff of the Soho Hospital for Women, for meritorious work, both in the wards and at lectures. Any donations may be sent to the secretary, Mr. Alfred Hayward, Hospital for Women, Soho-square, London, W.

THE RECOGNITION AND ISOLATION OF THE MENINGOCOCCUS IN THE NASO-PHARYNX OF CEREBRO-SPINAL FEVER CONTACTS.

BY JAMES McINTOSH, M.D. ABERD.,
SPECIAL BACTERIOLOGIST, ROYAL HERBERT HOSPITAL, WOOLWICH;
AND
W. E. BULLOCK, M.D. EDIN.,
TEMPORARY LIEUTENANT, ROYAL ARMY MEDICAL CORPS.
(From the Bacteriological Laboratories of the London Hospital and of the Royal Herbert Hospital, Woolwich.)

THE late outbreak of cerebro-spinal meningitis has afforded considerable opportunities for the study of the disease, and many observations made in previous epidemics have again been confirmed as the result of bacteriological investigation. In particular, attention has been directed to the question of the incidence of meningococcic carriers, since it is now well known that in the environment of patients the subject of the disease individuals are found who harbour the meningococcus, often in large quantities in the naso-pharynx. The importance of these so-called contacts is now generally admitted, and it would appear rational that such contacts should be isolated if the disease is to be prevented from spreading. The feasibility of carrying out such a plan would depend upon the number of such contacts, and the persistence of the meningococcus in the throat, always assuming that the diagnosis of meningococcus was correct. Now, as is well known to all bacteriologists, the certain diagnosis of meningococcus is not always easy, and an erroneous diagnosis might entail great hardship on the individual the victim of such a diagnosis. A glance at the recent literature would seem to show that in a number of instances the diagnosis of meningococci in throat swabs has been arrived at by very incomplete methods of analysis. Apart from the fact that the meningococcus presents no distinctive staining reactions, there are several other bacteria occurring in the throat which can be differentiated from it only by complicated reactions, and perhaps not always even then.

The present paper is a short account of the methods which we have found most useful, as a result of an extensive experience.

The Source of the Material.

In every instance the material was taken from the posterior nares. The swab, consisting of a piece of sterile wool attached to the end of a piece of stout wire, bent at an angle, is introduced below the soft palate, and rubbed against the posterior of the pharynx, care being taken not to touch the tongue. The swab is then withdrawn and replaced in its sterile glass tube. An ordinary diphtheria throat swab bent at the end is quite as efficient as, and much easier to manipulate than, many of the more elaborate pharyngeal swabs that have been recommended. It is of great importance that the culture medium should be inoculated from the swab as soon as possible, since the percentage of positive results falls progressively with the prolongation of the interval between the taking of the swab and its inoculation on the medium.

Medium.

After giving extensive trials to a number of different media, the one which we have found most satisfactory is serum agar of the following composition: Nutrient 3 per cent. agar, 3 parts; horse serum, unheated, 1 part. The nutrient agar should be neutral to phenol-phthalein and made from beef broth. On this medium the meningococci will grow with great rapidity, and after having undergone one or two subcultivations will live several weeks without further subculturing. The importance of unheated serum in obtaining cultures of the gonococcus was emphasised many years ago by Wertheim, and has been abundantly confirmed. The difficulty of obtaining sterile horse serum which has not been sterilised by heating can be overcome by the use of etherised serum.[1] After the blood has been collected in a sterile pot at the slaughter-house it is allowed to clot and the serum obtained. Ether to the amount of 5 per cent. is then added to the serum in a glass-stoppered bottle. The stopper is tied in and the bottle heated in a water-bath at 45° C. for one hour, after which it is placed in the incubator at 37° C. for several days, by which time the serum is sterile. For use the serum is removed from the bottle with a sterile pipette, placed in a large test-tube, and heated in the water-bath for a few minutes with continuous shaking until the ether has ceased to bubble off. The serum if bile-stained should be discarded, as the presence of bile seems to exert an inhibitory effect. The horse serum may be replaced by ox serum or ascitic fluid.

Amongst media which have been utilised for the growth of meningococcus particularly in this country "nasgar" has had considerable vogue. As its name implies, it is a mixture of nutrose, ascitic fluid and agar. Nutrose was used by Wassermann (1897) for the growth of gonococci, as he found that in its presence the serum could be heated to the boiling point without coagulation, and thus he was able to overcome the trouble of easily obtaining sterile serum. Wassermann's nutrose pig serum has not in general been found equal to the unheated serum agar as a medium for the growth of gonococci, and nasgar in our hands has been uniformly inferior to the serum agar above described. The following descriptions apply entirely to growths of the meningococcus and microbes likely to be associated with it in throat swabs, on a medium the basis of which is serum agar.

Meningococcus.—The colonies of meningococcus are more or less characteristic, and with a little practice can be recognised with considerable ease. While examining the plates there are four main features to bear in mind—namely, (1) the size of the colony, (2) its shape, (3) its colour, and (4) its transparency. The Petri's plate should first be held up against a good light (window) and looked over generally, and any likely colonies examined with a hand lens (× 8). The plate is then placed on a dark surface and the colour of the colonies noted. The meningococcus colonies after 24 hours' incubation measure from 1 to 2 mm., colonies less than 1 mm. are either streptococci or pneumococci; the meningococcus colonies are quite circular, compact with a regular margin, are clear and transparent, and of a moist and slightly slimy consistence. When the plate is held up against the light the colonies have a slight bluish appearance not unlike very young coli colonies; viewed with the hand lens, however, the colonies are practically colourless. Under the microscope the colonies are colourless and show a faint granularity. But when the plate

[1] Fildes and Rajchman: THE LANCET, June 12th, 1915.

is placed against a dark background the colonies are seen to be a distinct pearl grey.

Micrococcus catarrhalis.—This grows as a distinct greyish-white, compact, more or less rounded colony, about 1 mm. in diameter; under the hand lens the colonies are seen to be much less transparent and more granular than the meningococcus, while their margins are often slightly irregular with a clearer surrounding zone. The characteristic features are a tenacious consistence, tendency to come off whole on the platinum loop, and the facility with which the growth can in comparison with the meningococcus be emulsified in saline.

Micrococcus pharyngis siccus.—The colonies are not so round and are much more opaque than the meningococcus and are yellow, dry, and tenacious.

Streptococcus mucosus.—It grows as a round, perfectly translucent, clear as water colony, measuring on the average about 2 mm. in diameter. The extraordinary clearness of the colony is usually sufficient to distinguish it, quite apart from the fact that it is Gram-positive.

Micrococcus flavus.—The micrococcus flavus colonies are at times not at all unlike those of meningococcus, and especially when the colour has not developed; in many instances indeed the production of colour is the only reliable distinguishing feature. The colonies, however, may be said to be rather more opaque than those of the meningococcus, with a tendency to be less discrete and to have a yellowish-brown colour. In older growths the colour may become well marked, varying from a yellow brown to a distinct golden yellow.

Streptococcus and pneumococcus group.—Here the colonies, as already mentioned, are clear and pin-point in size and therefore easily excluded.

Staphylococcus group.—The size and opacity of the colonies are sufficient to put them out of question at once.

Supplementary Tests.

The macroscopic appearance of the colonies of course serves only to identify meningococcus-like growths, and one has to confirm this macroscopic diagnosis as far as is possible by certain supplementary tests, such as fermentation reactions, complement-fixation reactions, agglutination reactions, &c. But some of these procedures in our hands have not proved sufficiently constant to be used as a routine measure. In particular this refers to the agglutination and complement-fixation reactions. Arkwright found that more than half of his strains were not agglutinated by a specific serum prepared by him, while Elser and Huntoon say that about 40 per cent. of meningococci strains are practically inagglutinable. The only applicable tests remaining, therefore, are the fermentation reactions, the question of growth at 22° C., and the colour of the growth, but even with these, as we shall see later, the results obtained are not always absolutely definite.

1. *Fermentation.*—It was found most convenient to use solid media for these tests—namely, etherised horse-serum agar as used for growing the meningococcus, containing 1 per cent. of the necessary sugar and 5 per cent. of litmus solution. We used the following five sugars—maltose, glucose, saccharose, lactose, and lævulose, fermentation being judged to be complete after four days. In the case of some 50 strains of undoubted meningococcus isolated from the cerebro-spinal fluid of cerebro-spinal fever cases, all except 3 fermented only glucose and maltose, these being the accepted fermentations of meningococcus. Of the three exceptions, one fermented glucose only and the other two did not ferment any of the test sugars. Most of these strains have again been tested after an interval of three to six months and no change in the fermentations has been observed. Of the strains isolated from the throat, and which were believed to be meningococcus, all except one fermented only maltose and glucose, and this one fermented only glucose (parameningococcus). The strains of micrococcus flavus which we have isolated have fermented only maltose and glucose, and never lævulose as stated by von Lingelsheim. There is, however, a quantitative difference in the fermentation powers of meningococcus and micrococcus flavus; the latter ferments the sugars more rapidly and produces more acid, as is shown by the medium frequently becoming opaque from coagulation of the protein. Micrococcus catarrhalis fermented none of the five test sugars.

2. *Question of growth at 22° C.*—The inability of the meningococcus to grow at 22° C. (as observed by Gordon) we have found to be a very useful confirmatory test, as none of our strains of meningococci would grow at that temperature while practically all the catarrhalis group did. But one must bear in mind that the growth at this temperature is apt to be slow; in fact, some of the micrococcus flavus strains took several days to appear. Buchanan also found that some of his strains of M. flavus showed no growth in 48 hours at this temperature.

3. *Colour of the growth.*—The colour of the suspected growth is of great importance, as in many instances it is the last practicable method of distinction. Kolle and Hetsch say that it is almost impossible to distinguish the meningococcus growth from that of the micrococcus flavus if the colour of the latter has not developed. From our own observations we are convinced that the above writers are correct. The presence of the slightest amount of yellow colour in the growth we regard as being sufficient evidence that the culture is not the meningococcus. This is borne out by the fact that all strains of meningococcus isolated from the cerebro-spinal fluid of actual cases are of a distinct pearl-grey colour. The yellow tinge of colour, however, is often so slight that it requires a very careful examination carried out in good daylight to detect it. The colour of the micrococcus flavus growth is somewhat intensified by growth on an agar medium containing glucose and 2 per cent. of gelatine. In some strains the colour takes several days to develop. In others the maximum amount of pigment is produced in 24 hours, after which the colour becomes less intense.

Concluding Remarks.

It must be admitted, however, that the foregoing procedure is not quite all that could be desired, and in our experience the greatest difficulty lies in distinguishing the meningococcus from certain strains of micrococcus flavus, especially when the pigment in the latter is slight and growth at 22° C. is delayed, as we have seen that their fermentation reactions, apart from a quantitative difference, are identical. The differential diagnosis therefore, in a certain number of instances, rests on a slight difference of colour. From what has been said it is clear that the importance of judging this difference in colour cannot be over-estimated, and we may repeat none of the strains of meningococcus isolated by us from the cerebro-spinal fluid of actual cases produced the slightest trace of a yellow colour, in all the colour being of a distinct pearl-grey.

Altogether over 2000 throats were examined for meningococcus, and of actual contacts 5·5 per cent. were found to have meningococci in their throats. In the various batches examined the percentage of positive results varied from 0 to 25; the highest figures were only found when the epidemic was at its height, and where there was considerable overcrowding and therefore a close association between patient and contacts. The detailed results of these examinations have been reported elsewhere. The average percentage of positive results obtained by us, though low in comparison with that obtained by some other workers, is, if anything, on the high side.

It is generally agreed that the isolation of undoubted meningococcus carriers is of great importance, and the question, therefore, of their frequency requires to be definitely determined. If the high percentage of positive contacts found by some workers approximates the real facts, then, apart from the difficulty of examining the huge number of contacts in a large epidemic, the isolation of carriers becomes impracticable. But from our extensive experience we are convinced that meningococcus carriers are less frequent than is generally believed; and given an easy, rapid, and definite means of detecting the meningococcus in the naso-pharynx, it should be possible to check an epidemic of cerebro-spinal fever in any small community or body of men—e.g., a military unit—where the movements of individuals are under control. Unfortunately, however, the whole subject of meningococcus carriers appears to require a thorough and an elaborate investigation, as hitherto it has been treated in much too uncritical a manner.

Bibliography.—J. A. Arkwright: Varieties of the Meningococcus, with Special Reference to a Comparison of Strains from Epidemic and Sporadic Sources, Journal of Hygiene, vol. ix., p. 104. W. J. Elser and F. M. Huntoon: Studies on Meningitis, Journal of Medical Research, 1909, vol. xx., p. 377. M. H. Gordon: The Micrococcus of Epidemic Cerebro-spinal Meningitis and its Identification, Report to the Local Government Board, 1907. W. Kolle and H. Hetsch: Die Experimentelle Bakteriologie und die Infektionskrankheiten, Berlin, 1911. W. von Lingelsheim: Meningokokken und verwandte Bakterien, Klinisches Jahrbuch, 1906, Band xvi., p. 372. R. M. Buchanan: Transactions of the International Congress of Hygiene and Demography, Berlin, 1908, Band iv.

DOUBLE EPISIOTOMY DURING LABOUR.

BY JOHN PHILLIPS, M.A., M.D. CANTAB., F.R.C.P. LOND.,

CONSULTING OBSTETRIC PHYSICIAN, KING'S COLLEGE HOSPITAL.

THE operation of double episiotomy during labour is one which has been known and carried out for many years, but I think that its value as a means of preventing perineal laceration is not sufficiently recognised. I have therefore taken this opportunity of bringing it once more before the profession, having had a large experience of its utility.

The ordinary perineal laceration is best observed by everting the posterior wall of the vagina through the vulva by the insertion of two fingers into the rectum, and after carefully swabbing the tears to draw them together with a tenaculum, first in one direction and then in another, until the position in which they come together best is found.

My observations would tend to show that the chief lacerations consist of three essential portions. First, two bilateral, nearly longitudinal, tears of the vaginal walls, united at their lower extremities by a transverse tear, which is the second and most essential portion of the typical laceration. The plane of this tear is practically at right angles to the vaginal axis, and it is situated just within the constricting band formed by the superficial muscles. To these two portions may be added a median tear of the superficial tissues, which is usually called the perineal laceration. There seems to be no doubt that the former take place much before the latter, and that therefore when one sees the anterior part of the perineum tearing during the passage of the vertex we may be quite certain that there have already occurred one, if not both, of the deeper lacerations of the posterior vaginal wall higher up. The object of double episiotomy is to obviate one or all of these taking place.

Technique of the operation.—Let us suppose that the vertex is in process of crowning, the pains regular and strong, the patient inhaling a little chloroform, though not deeply under its influence. As the occiput begins to protrude through the vulva a finger is slipped into the orifice and the tension of the two sharply defined rings that constitute the chief obstruction is carefully noted. The inner ring is the lower orifice of the vagina or hymen on the stretch; the outer ring is the vulval orifice, made up mainly by dense skin and a little fascia. When the proper moment arrives the operator should take a pair of blunt-pointed scissors and make an incision on either side of the vulva, commencing inside the inner constriction ring and sufficiently deep to sever the skin, the subcutaneous connective tissue, the fascia, and possibly the bulbo-cavernosus muscle. The length of the incision should be from 1 to 1½ inches and about a quarter of an inch deep; the direction of the incision should be horizontal or in the long axis of the body. If the incision is directed towards the tuberosity of the ischium and points towards the posterior vaginal wall, the cut will tend to be prolonged into it and the perineal body, thus making any laceration worse instead of preventing it. The proper incision—namely, at right angles to the vulva, affords more expansion and no danger, and is situated where the anterior and posterior vaginal walls fall together.

Two theoretical objections, which I have never been able to confirm in practice, may be brought against the incision—namely, that the vulvo-vaginal gland may be severed or injured and the bulbous vestibule may be wounded. The cut, however, usually in all probability passes anterior to the duct and should never be deep enough to injure the vessels. Should the patient be deeply under an anæsthetic and the forceps applied, the value of the operation can be seen at once, as the head may be fairly described as "tumbling out." Immediately after the delivery of the child, and before the expulsion of the placenta, I usually pass two or three gut sutures transversely through each incision, securing the ends temporarily by Spencer Wells forceps; the parts come together quite easily and after the placenta is removed the sutures may be tied. In ten days scarcely a trace of the scar is left.

Indications for the operation.—1. An exceptionally large head. 2. A long and rigid perineum. 3. Atresia, congenital or acquired, of the vagina. 4. A threatened central rupture of the perineum. 5. An unreduced occipito-posterior presentation, where restitution is impossible. 6. In breech cases in which the after-coming head has to be rapidly delivered owing to threatened stillbirth of the child. 7. A narrow pelvic arch, as is present in the "male" type of pelvis.

In the last 15 years, during which period I have practised this operation, I have performed it 156 times. In 118 cases the patient was in labour for

the first time, and in the other 38 she either had an unreduced occipito-posterior presentation, a much scarred and undilatable perineum, the child's head was unusually large, or the after-coming head required rapid delivery to prevent stillbirth. In none of them did any untoward symptoms arise; the patient was unaware either of the incisions being made or of the sutures being passed. I usually use a pair of stout, blunt-pointed scissors, such as is employed in cutting the umbilical cord.

I do not purpose here to enter into the history of the operation; this has already been thoroughly worked out by Wilcox.[1] The steps of the operation, with careful drawings of the direction of the incision, are admirably described and figured by Dickinson.[2] Parvin[3] was one of the earliest advocates of the operation in America.

Brook-street, W.

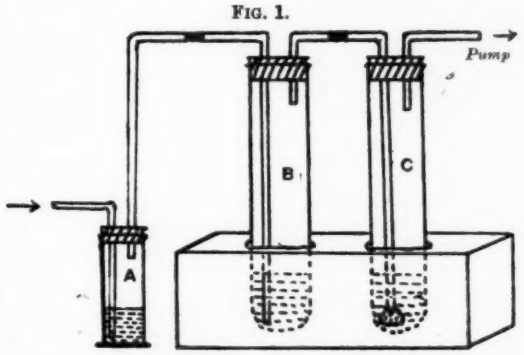
THE NITROGEN BALANCE IN DIABETES MELLITUS AND ITS IMPORTANCE IN TREATMENT.

BY P. J. CAMMIDGE, M.D. LOND., M.R.C.S., L.R.C.P. LOND.

IT has long been recognised that the essential feature of diabetes mellitus is a failure of carbohydrate metabolism, with the consequent presence of sugar in the urine. As the metabolic changes have been more thoroughly and completely investigated it has been increasingly apparent, however, that a simple defect in the utilisation of carbohydrates is comparatively rare and that there is usually more or less interference with the utilisation of fats and proteins as well. These defects are relatively slight in some instances, while in others they are prominent and constitute the most serious feature of the case; but it is obvious that if the maximum benefit is to be derived from the dietetic treatment of the condition all deviations from the normal must be taken into account, otherwise a diet may be prescribed which in the end will do more harm than good. The failure of a "carbohydrate-free" diet to control the disease, or even to check the glycosuria in some cases, is thus frequently accounted for, since it attempts to deal with only one feature of the case, the defective utilisation of carbohydrates, and neglects other possible deficiencies in metabolism. With the discovery of the acetone bodies, and the realisation of their significance as a sign of faulty fat metabolism, an important advance was made on Rollo's plan of excluding carbohydrates as much as possible from the diet in all cases of glycosuria, and it is now common knowledge that the persistent presence of acetone bodies in the urine is an indication that an ordinary "strict diet" cannot be tolerated. The occurrence of defects in the utilisation of proteins and the results of increasing the protein content of the diet beyond the patient's powers of dealing with them efficiently are, unfortunately, not so well known, although they are equally important. One reason for this neglect undoubtedly is that the products of imperfect protein metabolism cannot be recognised in the urine by an easily applied colour-test like sugar, acetone, or aceto-acetic acid, but are only to be detected by making a series of quantitative analyses of the collected and measured 24 hours' excretion when the patient is on a diet of known composition. As a similar series is needed for the accurate determination of the carbohydrate tolerance of the case, it only entails a little extra work on the part of the observer however.

The simplest and most easily obtained criterion of the state of protein metabolism is the nitrogen balance—that is to say, the relation between the intake of nitrogen in the food and the total nitrogen output in the urine. The former may be estimated from food tables, the latter is best determined by Kjeldahl's process or some modification of it. The method used in my laboratory is carried out as follows. One cubic centimetre of the mixed urine is carefully measured by means of an accurate pipette into a Jena glass flask or large test-tube, 2·5 c.c. of pure concentrated sulphuric acid and four drops of platinic chloride solution (1 per cent.) are added, and the mixture is heated in a fume chamber, or with the flask connected to Folin's fume-absorber, until it is colourless (usually about half an hour). The flask is then cooled and its contents are washed out into an aspiration tube (B) (Fig. 1) with about 20 c.c. of

FIG. 1.



water. The tube is afterwards cooled and about 5 c.c. of paraffin oil are poured in. Having ready a rubber stopper provided with the necessary connexions 20 c.c. of sodium hydrate solution (30 per cent.) are added, the tube is then corked and quickly connected to a receiver (C) containing 10 c.c. of decinormal sulphuric acid. The inlet branch of the aspiration tube is joined to a wash-bottle containing strong sulphuric acid (A) and the outlet branch of the receiver to a suction pump. A current of air is drawn through the apparatus for an hour, slowly at first and then more quickly. At the end of that time the apparatus is disconnected and the acid in the receiver titrated with N/50 sodium hydrate solution, using alizarin red as the indicator and continuing until the solution turns red, not violet. The difference between the reading obtained and the amount of acid placed in the receiver (calculated on the same basis as the strength of the sodium hydrate) multiplied by 0·028 gives the percentage of nitrogen. Thus if 12 c.c. of soda solution were used the difference between this and the amount of acid in the receiver would be 38 (for 10 c.c. of decinormal acid is equivalent to 50 c.c. of N/50 acid, and 50 − 12 = 38). Multiplying by 0·028 we have 1·064 per cent. of nitrogen. This multiplied by the decilitres of urine passed in the day (e.g., 1200 c.c.) gives the total nitrogen output in the urine (e.g., 1·064 × 12 = 12·768, or, in round figures,

[1] The Operation of Episiotomy, New York Medical Journal, 1885, p. 178, with literature.
[2] Transactions of the American Gynæcological Society, 1892, p. 391, with literature.
[3] Ibid., 1882, p. 137.

12·8 grammes). The advantages of this method are that it is economical of labour and time if several specimens are to be examined and when the aspiration process for estimating true ammonia nitrogen and amino-acid nitrogen[1] and the urease method for determining urea[2] are employed, since they can be run in series on the same pump. To allow of the body completing the catabolism of the protein as well as the carbohydrate of each day's diet the collection of the urine should be arranged so that the longest possible interval intervenes between the last meal and the finish of the 24 hours period. It is usually best to start the collection with the first specimen voided after breakfast and finish with the last passed before that meal next day in order that at least 12 hours without food will elapse before the collection is completed.

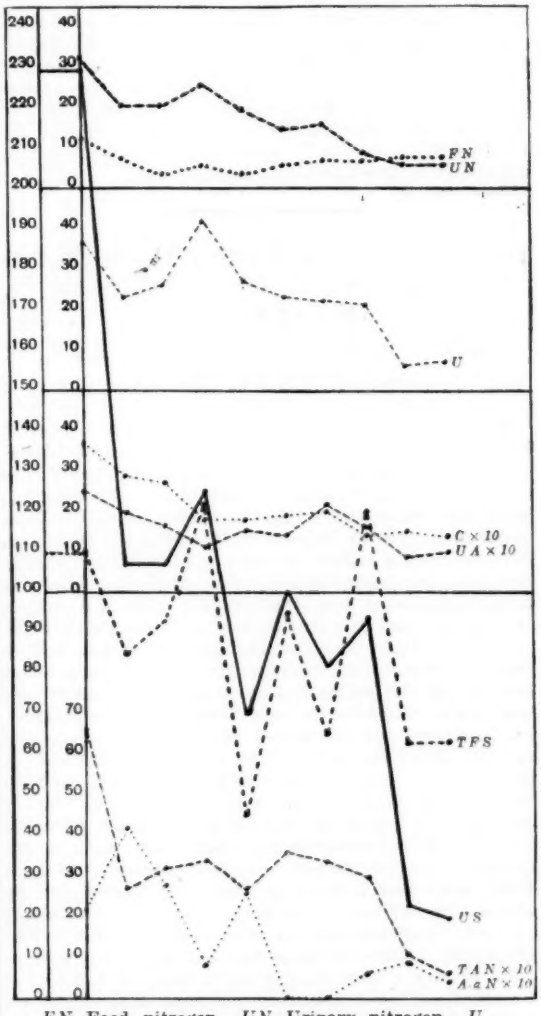
In a healthy individual the total urinary nitrogen is practically equal to the amount ingested, barring the small extra-renal excretion in the fæces, perspiration, hair, and nails, which averages about 1 gramme daily. The level of nitrogenous equilibrium varies with the character of the diet, although there is always a tendency to establish a correspondence between the intake and the output in spite of wide variations in the nature of the food. A similar tendency is seen in diabetics, but their powers of adaptation are diminished, and in advanced cases may be very defective. A highly protein diet raises the output of nitrogen in the urine as in a healthy person, but the increase is often out of proportion to the intake and remains so, or even tends to increase, as long as the excess is continued. A diminution of the protein, on the other hand, will frequently bring down an excessive excretion of nitrogen in the urine more than can be accounted for by the lessened intake of nitrogen in the food. This is probably to be accounted for by an increased susceptibility of the diabetic to the specific dynamic effect of protein, with a consequent tendency to abnormal tissue waste, owing to the defective utilisation of carbohydrates. The addition of protein foods to the diet of diabetics frequently fails, therefore, to accomplish its aim, and instead of improving nutrition only raises the level of metabolism and promotes tissue waste. In cases where the utilisation of sugar is very defective an increase in the glycosuria also results and the excretion of oxybutyric acid and acetone bodies rapidly rises, owing to the inability of the tissues to oxidise the sugar and fatty acids derived from the non-nitrogenous portion of the amino-acids formed from the ingested and broken-down tissue proteins. The prognosis in cases where the output of nitrogen in the urine regularly exceeds the intake in the food is always serious, for unless nitrogenous equilibrium can be established loss of weight and strength must continue, while the tendency will be for the glycosuria and acidosis to increase. Systematic reduction of the protein intake, guided by daily analyses of the urine, often suffices to control the condition, but rest in bed, with freedom from excitement and worry, is sometimes also necessary. The free use of opiates may be required occasionally. In my own practice I now very rarely use preparations of opium except in severe cases where nitrogenous equilibrium cannot be established by any other means.

The following case (Fig. 2) illustrates in a striking manner the results that can be obtained by regulating the diet according to the nitrogen balance.

[1] Cammidge: THE LANCET, Nov. 8th, 1913, p. 1319.
[2] Marshall: Journal of Biological Chemistry, vol. xiv., 1913, p. 283; vol. xv., 1913, pp. 487 and 495.

The patient, a naval officer aged 24, was advised to consult me by Mr. P. S. B. Wetherall, of Weymouth. When I saw him on July 24th, 1915, he stated that, although he had suffered from heartburn and some abdominal discomfort occasionally for two or three years, his general health had been good until Christmas, 1914, when he noticed that he was very thirsty and easily tired. His urine was examined and sugar

FIG. 2.



FN, Food nitrogen. *UN*, Urinary nitrogen. *U*, Urea. *C* × *10*, Creatinin × 10. *UA* × *10*, Uric acid × 10. *TFS*, Total food sugar. *US*, Urinary sugar. *TAN* × *10*, True ammonia nitrogen × 10. *A-aN* × *10*, Amino-acid nitrogen × 10.

was found. Under treatment by an "anti-diabetic" diet, containing as much meat and other protein foods as he cared to take and with a limited allowance of carbohydrate, his thirst had diminished, but he steadily lost weight and was obviously getting weaker. Physical examination showed nothing of note except a patch of xanthoma diabeticorum on each forearm. His blood was found to contain 0·33 per cent. (?) of sugar, but as there was marked lipæmia, which interfered with accurate estimation, it was probably higher. His alveolar air contained 3·4 per cent of carbon dioxide, as compared with the normal of 5–6 per cent., showing that there was considerable acidosis. I took him into a nursing home and put him to bed at once. On a diet containing 73 grammes of protein (12 grammes of nitrogen) and 52 grammes of carbohydrate, with a total sugar value of 110 grammes, allowing for the sugar which could be formed from the protein, a 24 hours collection of

the urine measured 5270 c.c. and contained 229 grammes of sugar (4·35 per cent.), 31·8 grammes of nitrogen, 19·7 grammes of beta-oxybutyric acid, 1·05 grammes of acetone bodies, 6·6 grammes of ammonia nitrogen, 1·05 grammes of calcium, 0·84 gramme of magnesium, 2·2 grammes of amino-acid nitrogen, 36·4 grammes of urea, 2·5 grammes of uric acid, 3·74 grammes of creatinin, and 8·4 grammes of phosphates. There was also half a gramme of albumin, and microscopical examination showed numerous hyaline and finely granular casts. Altogether the case was apparently as hopeless as it could be, short of actual coma, which seemed imminent. It was evident that the patient was passing more sugar in his urine than could be accounted for by the carbohydrate, or even the protein, in the diet and that he was forming sugar from his own tissues. The nitrogen balance tended to confirm this conclusion, and with the markedly abnormal excretions of amino-acids, uric acid, creatinin, &c., pointed to there being serious tissue waste and defective protein metabolism. That a similar inability to metabolise fats, as well as carbohydrates and proteins, existed was shown by the lipæmia and the high output of oxybutyric acid, while the excess of ammonia nitrogen, calcium, and magnesium pointed to there being serious acidosis. The protein of the diet was reduced to 47 grammes (7 grammes of nitrogen) and then to 20 grammes (3 grammes of nitrogen), but the sugar value was kept at nearly the same level, with the result that the sugar excretion promptly fell to less than half its former value (viz., to 107 grammes), and the total nitrogen dropped over twice the amount corresponding to the reduction in the food nitrogen (viz. to 20 grammes). At the same time the oxybutyric acid came down to 6·2 grammes and with a marked fall in the ammonia nitrogen, calcium, and magnesium showed that there was a considerable improvement in the acidosis. The protein intake was then slightly raised and more carbohydrate was given, but as the urinary nitrogen and sugar excretions promptly rose, although not nearly to their former level, both were again reduced with a resulting further fall. A second attempt to increase the nitrogenous intake, and later the amount of carbohydrate in the diet, was more successful, giving rise to only a temporary rise in the sugar excretion and causing no appreciable increase in the urinary nitrogen. The latter then steadily fell until finally nitrogenous equilibrium was established, an intake of 7 grammes of nitrogen in the food being represented by an output of 5 grammes in the urine. At the same time the quantity of urine was reduced, ranging about 2000 c.c., and the sugar excretion came down to 20 grammes for the 24 hours. The albumin completely disappeared and no casts could be found. Examination of the blood now showed 0·2 per cent. of sugar, with only very slight lipæmia. The alveolar carbon dioxide had risen to 4·6 per cent., and the oxybutyric acid excretion had fallen to 3·6 grammes.

Since the patient returned home I have heard that his strength has much improved and that he is able to take a fair amount of exercise without fatigue. He is bright and cheerful, and his present condition is in marked contrast to his desperate state three months ago.

Abnormalities of the nitrogen balance are not confined to advanced and serious cases, but may exist when the urine contains only a small amount of sugar and when the glycosuria has been controlled by an "anti-diabetic" diet. Loss of strength, irritability of temper, nervous distubances, neuralgic pains, and complaints of difficulty in keeping warm are the commonest subjective symptoms. Diminution in weight is a more certain indication, but is apt to be a fallacious guide unless found to be progressive in character. As an example of this type I may quote a case brought to me in January, 1912, by Dr. J. D. R. Munro, of Nantwich.

The patient was a lady, aged 37, who had been found to be suffering from glycosuria the previous September, when her urine contained 2 per cent. of sugar. Seen by a well-known London physician, she was put on an "anti-diabetic" diet of the usual type. For a time she improved, but in November she complained of being depressed and miserable, and it was found that she was losing weight. A second consultation was arranged therefore. She was then advised to adhere to the diet that had been previously prescribed and to go abroad for the winter. This she refused to do, although she was warned that her only hope lay in wintering in a warmer climate. When I first saw her, in January, 1912, she was so emaciated that it was painful for her to sit or lie for long in one position, and she stated that she had lost 18 lb. in weight in the previous three months. Her urine contained only a trace of sugar, but there was a well-marked reaction for acetone and aceto-acetic acid. A new diet was given her, but as she did not improve very much I advised her to come into a nursing home in order that her metabolism might be thoroughly investigated. After some delay it was arranged. On a diet containing 70 grammes of carbohydrate, 97 grammes of protein (15 grammes of nitrogen), with a total sugar value of 148 grammes, she passed 2600 c.c. of urine containing 9·6 grammes of sugar and 24 grammes of nitrogen. The nitrogen content of the diet was reduced to 13 grammes and the urinary nitrogen fell to 20 grammes. A further reduction of the food nitrogen to 10 grammes was followed by a drop in the nitrogen of the urine to 8 grammes, 1 gramme less than the intake when allowance was made for an extra-renal excretion of 1 gramme. Meanwhile the sugar excretion had also dropped in spite of the fact that the quantity of carbohydrate in the diet was kept at about the same level. At the same time the acetonæmia diminished and only faint traces of acetone could be detected in the urine. For a few days the patient's weight remained stationary, but when she left the home she was 2½ lb. heavier than when she came in. On the diet which was then prescribed the increase in weight continued and by the middle of December, 1912, she was 1 st. 10 lb. heavier than when I first saw her 11 months before. Subsequently the weight has remained constant save for slight variations in either direction probably due to accidental causes. Nitrogenous equilibrium has been well maintained ever since it was first established, even when more protein was slowly and cautiously introduced into the diet. When the patient left the home her urine was free from any trace of sugar, and although there has been some glycosuria at times it has responded to readjustment of the diet.

I think there can be little doubt that this patient, like many others, was the victim of a rule-of-thumb method of treatment based upon empirical findings obtained over 100 years ago, for as soon as her diet was arranged on lines in accordance with modern research she improved rapidly and, as she says, "life became worth living." At any rate, she is now in comparatively good health and is able to follow her ordinary occupations in comfort and with enjoyment, four years after she had been warned that her span of life was likely to be measured by months rather than by years.

Nottingham-place, W.

OPHTHALMIC NOTES IN A GENERAL HOSPITAL IN EGYPT.

BY C. WYNN WIRGMAN, M.D. LOND., F.R.C.S. ENG.,
LIEUTENANT, R.A.M.C. (T.).

FOR two months I was in charge of the ophthalmic wards in the hospital to which I was attached in Egypt, and during that time about 100 ophthalmic cases came under my care, besides ordinary wounds, as the wards could not be entirely reserved for the former. A few notes on the ophthalmic cases may be interesting as showing the range of work.

Cases sent up to the hospital from convalescent camps constituted an out-patient clinic, from which any case requiring special attention was admitted. Of cases directly from the front the great majority naturally were injuries, while from the convalescent camps refractive errors were in the majority. In many of the latter it was a matter of surprise that they had ever been passed fit for service, as the defects of vision were so gross that the most casual examination could not have

missed them. For example, one man had a refraction of − 8·0 sph.; another, right eye cyl. − 5·0 hor., sph. − 3·0, left eye cyl. − 5·0 hor., sph. − 1·0. A noticeable point was that refraction without a mydriatic was in many cases impossible, owing to spasm of accommodation. In several instances of injured from the front it would have been better if atropine had been used more freely during the voyage. As throughout the war, the spirit and endurance of the wounded were beyond all praise.

CASE 1.—Shrapnel wound of right orbit. The bullet had entered from behind forwards through the right temporal fossa. A skiagram showed the bullet under the globe balanced on the anterior margin of the orbit. Four minute fragments of metal were also seen in the sphenoidal fissure. Vision nil; much swelling and ecchymosis. The globe was removed by Lister's modification after removal of bullet. The small fragments of metal were left *in situ*. The orbital wall was not damaged. For a few days there appeared some danger of orbital cellulitis, but the symptoms disappeared and the socket was quite clean in a few days.

CASE 2.—Right eye injured five days before arrival. On admission a notch was observed at the lower margin of the right lid, and a cut in the conjunctiva, which did not, however, appear to be part of a perforating injury. There were hyphæma and loss of red reflex in the lower part of the field. The iris was irregular, but reacted. On further examination a few days later the hyphæma was disappearing; projection was fair below, but a good deal of conjunctival injection had appeared. Tension was very markedly increased, and the red reflex noticeably diminished. A stereoscopic examination showed a foreign body in the outer and upper part of the globe. Enucleation was performed and the case did well. Afterwards the globe was examined under the screen and a foreign body was well shown.

CASE 3.—Admitted May 21st. Left eye struck by splinter 11 days before admission. The left eye was intensely congested; slight hypopyon; two ulcers, one on the cornea, the other at "11 o'clock" on the limbus. A piece of metal was removed from the cornea. Vision: hand movements only. A stereoscopic radiogram gave a doubtful result as the patient moved. May 24th: Not dilated; still some hypopyon. 25th: Began to dilate; hypopyon gone. 29th: Eye quiet; vision 3/50, pupil well dilated.

CASE 4.—On May 19th a bullet struck the patient's bayonet and splintered it, one of the fragments lacerating the cornea. There was a perforating injury of the right cornea, with prolapse of the iris, traumatic cataract, and blood in the anterior chamber. The iris was adherent to the cornea. Perception of light to a very slight degree; much injection; tension + 1. May 31st: Pupil slightly dilated; injection not great. A blood-vessel in the adherent iris was very well-marked. June 2nd: An iridectomy was performed and the adhesion divided. For the next two days the eye looked quiet. After this I was obliged to go into hospital myself, so could not watch progress. By the courtesy of Mr. R. G. Waddy I saw the case in about three weeks' time, when the cornea was smooth and the vessel much diminished in size, but the clot over the pupil was organised and the pupil not dilated. There was a ring of circumcorneal injection and no perception of light. The ball of the eye was very soft. Enucleation was advised, and done the next morning. The case did well.

CASE 5.—This was not a case of injury, but one of old choroiditis, in which there was a certain amount of loss of visual acuity. Six years ago the patient noticed "black specks floating in front of the eyes, which were more noticeable after shooting." Two years later this got worse; he gave up his occupation of clerk and stopped reading, taking to farm work. On coming to Egypt the spots became worse, and a "curtain" seemed to rise in front of the target when aiming. On ophthalmic examination a patch of old choroiditis was seen at the upper and inner part near the right disc. No signs of fresh trouble were observed, but there was a thin floating film, resembling a cotton fibre, lying horizontally across the field, in the vitreous. This may have been the relic of an old hæmorrhage. Further active service was not recommended.

CASE 6.—The patient when admitted was in a very toxic condition. No coherent account of the injury could be obtained, but almost certainly a grenade had exploded in his face. The right eye was a mere bag of pus, and the condition of the left one could not be examined until he was anæsthetised. Then it was found that the left conjunctival sac was obliterated with the exception of two tiny areas of normal tissue. There appeared to be an eye under the scar tissue so no operative procedure was carried out at the time as he might have injured himself unconsciously. The right eye was removed with a good deal of difficulty owing to dense adhesions. All went well with the local condition and in a few days his general state was good enough to allow of his removal to a hospital ship.

I saw one case of old-standing retinitis pigmentosa and two or three cases of amblyopia without other cause than shell shock. Of trachoma, rather to my surprise, only one suspicious case occurred. Conjunctivitis of a slight character was moderately frequent, but yielded quickly to treatment. Many of the orbital wounds were combined with lacerations of the lids, in which plastic operations were deferred until the septic state had cleared up completely. This, of course, meant that it would have to be done in England.

I would advise anyone who may have to deal with ophthalmic cases to provide himself with the following outfit, not forgetting a private store of atropine: Lacrimal syringe, with spare nozzles; punctum dilator and probes; iris forceps and Wecke's scissors; sharp spoon for scooping out globe contents; drop-bottle and some apparatus for irrigation; lid retractor with screw adjustment; and a set of test-types, distance vision.

Dawson-place, W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

Continued Discussion on Paratyphoid.

A MEETING of this section was held on Nov. 23rd, Sir WILLIAM OSLER, immediate Past-President, being in the chair.

Colonel Sir WILLIAM LEISHMAN, R.A.M.C., who reopened the discussion, said that his experience related to paratyphoid as it was met with in France. The cases had not been many, only 1200 during the first 15½ months of war. He agreed with Sir Bertrand Dawson that they were not grave as regards danger to life. Eighteen had died, the case mortality being 1·5 per cent. The total number of cases of typhoid and paratyphoid combined was less at present than at any time since October, 1914, and numbered only 32. The relative proportions of paratyphoid A and paratyphoid B had not been accurately determined, but the latter comprised approximately two-thirds to three-quarters of the paratyphoid infections. Although paratyphoid A was the prevailing type in India, its occurrence in France was not limited to the Indian troops. There had been no such explosive epidemic as could be ascribed to a water-borne infection, the source of the cases being probably carriers. Stringent measures had been taken to limit the spread of the disease. At the clearing stations a blood test was performed on all suspected cases. They were then transferred to a general hospital at the base, and afterwards to an isolation hospital, where a competent bacteriologist and laboratory accommodation were available. When a positive diagnosis was made the medical officer of the unit from which the man had been sent was informed by telegram and a watch was kept for further cases. If any number occurred a bacteriologist carried out a thorough investigation. A spot map was kept at headquarters on which such cases were charted, unit by unit. A large proportion of the infection was derived from the native population, especially from the Belgian refugees. House-to-house visiting was carried out, the little farmhouses in which the refugees were living being visited, infected people being thus detected,

and afterwards isolated and treated in hospital. The chance of picking up infection from such sources was very great. For good services rendered by such visiting he mentioned with warm approbation the Red Cross unit of the Society of Friends. He did not agree with Professor G. Dreyer that many mild cases of the condition were unrecognised in France. This opinion was founded on Professor Dreyer's method of agglutination, which he (Sir William Leishman) thought contained some fallacies, and needed "controls" before it could be accepted in its entirety. Diagnosis by agglutination, with the low degree of dilution thought by Professor Dreyer to be sufficient, was not free from contention. There were many cases of mild fever at the front, due to many conditions. It was going too far to say that such belonged to the paratyphoid group; trench fever, for example, was a definite disease, and gave no agglutination for typhoid or paratyphoid. He thought it was probably mosquito-borne. He was not satisfied that Professor A. Castellani's evidence as to the value of mixed vaccines was conclusive. The dosage, he thought, was too small to give protection. Above all things we should not tamper with the typhoid element of the vaccine. The incidence of paratyphoid was roughly 1 per 1000, hence the need for protective vaccination against it was not very urgent, at all events in France.

Fleet-Surgeon P. W. BASSETT-SMITH, R.N., spoke from his experience of the naval cases admitted to the Dreadnought Hospital, Greenwich, and of the material from the Royal Naval Hospital, Haslar, and elsewhere. The greater number of them had come from the Dardanelles area, the diagnosis having been roughly made, laboratory examinations having been few, and little differentiation having been attempted. About September, 1914, antityphoid inoculation began to be carried out among such men as were likely to be landed with the Expeditionary Force. About the middle of this year paratyphoid cases began to be recognised, and a paratyphoid vaccine was prepared from strains obtained in Gallipoli. In every case of pyrexia a blood culture was made. The excreta were examined for the bacilli of typhoid and paratyphoid and for dysentery organisms, and agglutination was performed, Professor Dreyer's method being used if a sufficient amount of blood was procured. He had come to the conclusion that all cases from the Near East labelled as dysentery should be regarded as potential examples of paratyphoid fever. From bacteriological examinations of 70 cases at Plymouth, 11 per cent. proved to be typhoid, 40 per cent. paratyphoid A, 20 per cent. paratyphoid B, and 29 per cent. were indefinite. His own results at Greenwich had revealed 12 per cent. typhoid, 14 per cent. paratyphoid A, 36 per cent. paratyphoid B, 38 per cent. indefinite. Some of the indefinite cases were, no doubt, due to bacillus coli infection. Of 208 cases ascribed to typhoid 10 had died; of these 6 had not been inoculated, 1 had probably not been, and 3 had been inoculated. No case of paratyphoid had died. In the navy they had taken the view that it was worth while to provide immunity against paratyphoid if it were possible, and a vaccine had been used with increasing frequency. The typhoid vaccine had been administered first in two doses, and afterwards the paratyphoid in one or two doses. The latter vaccine was polyvalent. More recently a mixed or a triple vaccine had been used in two doses, the first containing 500 million typhoid, 250 million paratyphoid A, and 250 million paratyphoid B; the second 1000 million typhoid, 500 million paratyphoid A, and 500 million paratyphoid B. No more complaint of disturbance had followed than after the simple antityphoid vaccination, and the agglutination value obtained had been good. The amount of true typhoid agglutination had not diminished. He hoped that a full protection had been afforded against typhoid, and a moderate protection against the others.

Professor A. CASTELLANI (Colombo) spoke of his experience of paratyphoid in the tropics and in Serbia. In Ceylon, paratyphoid A was the usual infection; in Serbia, paratyphoid B. In general he agreed that paratyphoid was milder and of shorter duration than true typhoid, but there were many exceptions. He had seen cases of paratyphoid A ending fatally or lasting for several months. In the tropics the two could not be distinguished clinically, and therefore must be separated bacteriologically. The treatment was on the lines of true typhoid, a liquid diet being given for the whole course of the fever and for some days afterwards. He had known serious results follow the giving of solid food early in the disease, as was becoming customary in Europe and America. In Ceylon malignant cases were frequently met with, and it was better to be on the safe side. He could endorse Professor Osler's view that the fewer the drugs given the better for the patient, but thought that urotropine had a place in preventing infection of the gall-bladder. Vaccines were sometimes beneficial in certain protracted cases. Prophylaxis chiefly lay in the employment of antityphoid inoculation. In Ceylon he had for some years used mixed vaccines with satisfactory results.[1] He referred to his experiments, by which it had been shown that the immunity conferred by mixed vaccines was equal to that obtained if the vaccines were given successively. The degree of immunity bore no proportionate relation to the amount of vaccine used, provided that the minimum necessary to secure immunity was employed. Those inoculated showed no severe reaction, and could resume their duties within from 24 to 48 hours. The inoculated individuals produced agglutinating bodies for the three germs in amounts not less than if they had been injected with a monovaccine. There accrued advantages from mixed vaccines. Much time was saved. Paratyphoid A and B were protected against, and they were not rare, nor were mixed infections; and even triple infection occurred. The fear had been expressed that mixed vaccines did not give a sufficient degree of immunity against true typhoid fever, but that was not so. He could only conclude that a mixed vaccine should be used as a routine measure, instead of the ordinary monovaccine.

Dr. HENRY ROBINSON alluded to a few striking characteristics of paratyphoid. The onset was sometimes acute, shivers being not uncommon. Epistaxis occurred in about 30 per cent. of the cases. Headache and abdominal pain were the leading symptoms, but backache and vomiting were not rare. There was little abdominal swelling. Although the spleen was not usually palpable, its size as estimated by percussion, was often increased. Spots often did not appear until the fever had subsided, and were sometimes larger and more raised than those of typhoid. The abdominal reflex was frequently absent, though not more often than in typhoid, being abolished in just under 50 per cent. of the cases of each. Bradycardia was almost the rule during convalescence. The pyrexia varied considerably in duration, lasting from five or six days to three or four months. He did not think that paratyphoid A and B could be differentiated clinically. On clinical evidence he was of the opinion that there were many mild undiagnosed cases. He asked as to which was the most reliable, the hanging-drop method or Professor Dreyer's for estimating agglutination.

Dr. H. L. TIDY said that he had obtained the bacillus of paratyphoid in 66 cases. He regarded the old and new methods of performing the agglutination test as equally reliable. In a considerable number of the cases of paratyphoid he had obtained no agglutination of the bacillus typhosus, although the men had been inoculated within eight months. Febrile conditions apparently removed the agglutinins to the bacillus typhosus from the blood, and this factor must be taken into consideration by those who were compiling statistics on the persistence of the Widal reaction. A positive Widal reaction was equally valuable in the case of the inoculated and the uninoculated. After having disappeared the agglutinins perhaps returned again, but this was not usual. He thought that the effect of febrile conditions was to convert the agglutinins into agglutinoids. For separating the organisms from the excreta he thought that Carl Browning's "brilliant green" method was preferable to any other. He favoured MacConkey's medium for cultural purposes.

Captain KENNY (Canada) gave his experiences of paratyphoid at the Canadian Hospital, Taplow. There were 11 cases probably typhoid, and 22 cases in which the diagnosis of paratyphoid B and 3 in which the diagnosis of paratyphoid A had been established. Two were cases of mixed infection of paratyphoid A and B. Professor Dreyer's method of testing agglutinating power had proved quite satisfactory. He narrated a case in which, at necropsy, the lesions both of typhoid and dysentery were found.

Dr. CARL BROWNING expressed himself as deeply gratified by the favourable expressions which had been used regarding his method of separating the organisms. As modified it had now been reduced to the simplest possible procedure. He agreed with Sir W. Leishman that a careful

[1] See also p. 1206.

attitude should be adopted towards small oscillations in the agglutinating power of the blood.

After Dr. SCOTT TEBB and Dr. STOLKIND (Moscow) had spoken,

Sir WILLIAM OSLER brought the discussion to a close. He stated that paratyphoid was first distinguished by Professor Achard, of Paris, and exhibited temperature charts from the original article and from a case of his own.

SECTION OF OTOLOGY.

Exhibition of Case and Specimen.—Discussion on Skin-grafting in Mastoid Operations.

A MEETING of this section was held on Nov. 19th, Dr. ALBERT GRAY, the President, being in the chair.

Mr. W. STUART-LOW showed a case of Keratosis of the Auditory Meatus. It was considered to be due to irritation caused by the presence of a leptothrix, though there was no evidence of acute inflammation.

Mr. H. L. WHALE showed a very interesting specimen of Aspergillus Fumigatus which had been removed from the ear of a male patient aged 25 years. It took origin in cerumen in the mastoid cavity.

Mr. H. J. MARRIAGE introduced a discussion on the subject of Skin-grafting in Mastoid Operations. He said the cases for which skin-grafting was most advantageous were those of chronic mastoid disease. The chief credit for this method belonged to Mr. Charles Ballance,[1] who recommended and carried out, in 1900, the application of one or more large Thiersch grafts within a week or ten days after the performance of the radical mastoid operation. He (Mr. Marriage) took his graft from the front of the patient's thigh. Skin-grafting resulted in a better healing of the cavity than without it; stenosis in it was prevented, as also was the formation of granulations in various parts. The patient was also spared the pain which formerly was caused by firm plugging of the raw surface of the mastoid cavity. Moreover, the Eustachian tube was often closed, so that re-infection *viâ* that tube did not occur. In 99 per cent. of cases the graft took very well; and even where it was not a success, islets of cells were left behind from which regrowth took place. All depressions in the bone must be closed, so that no septic cavities were left behind. The graft must be very thin. Mr. Ballance found that the resultant hearing power was better than after the older methods of treatment. One disadvantage was the liability of the cavity to become filled with a collection of cerumen and epithelium, which might cause the skin surface to ulcerate; but that collection could easily be removed. Since 1908 he had used primary skin-grafting in cases of uncomplicated mastoid disease but not in acute mastoid disease, preferring in these cases to do the grafting at a later date. He paid much attention to the posterior meatal wall, removing, as far as possible, any exposed portion of cartilage, because the latter seemed responsible for the delay in healing in most cases. He stated the period of healing in 50 consecutive cases in which he carried out the procedure. Hearing was improved in 29 out of 39 cases, deteriorated in 8, remaining unaltered in 2. In cases of suppuration of the internal ear he did not apply a graft, because clear drainage was a necessity.

The PRESIDENT described the method which he had been carrying out for some time, but had not yet published. Immediately after the operation he scraped a considerable area of skin, after rendering it aseptic, and spread these young epithelial cells on to small sponges or pieces of gutta-percha. These cells were successfully engrafted and grew, and no trouble was experienced afterwards. Any cells which died were brought away by the syringing. In three weeks there was found to be a very considerable growth of epidermis at the site. He always exposed the dura mater purposely, because that increased the success of the transplantation.

Mr. C. E. WEST explained his method of procedure. He used a razor to take the graft. The operation he did was a thorough one, removing the posterior bony meatal wall as low as it was safe to. He did not mind whether dura mater was exposed or not. The cavity he cleared out as well as possible. The most difficult feature was to secure a sufficiently close apposition between the graft and the relatively soft tissues of the deeper surface of the concha; that was the most frequent site of granulations. He then discussed the contra-indications to the operation. The great danger one should always have in mind was that of infection of the labyrinth.

Mr. SYDNEY R. SCOTT expressed his general agreement with Mr. Marriage. Age did not appear to be a contra-indication. When drainage of the labyrinth was desired, it was most important not to graft. In his own cases he had not tested hearing with sufficient regularity usefully to deal with that point.

Mr. MARK HOVELL said he had carried out grafting in most of his cases, and laid stress on the need for the graft being very thin.

Mr. HUNTER TOD was not enamoured of the method. At the London Hospital 10 per cent. of the cases which had the mastoid operation performed had intracranial complications. In doing the mastoid operation he did not scrape the inner wall at all; the less the inner wall of the promontory was tampered with the less tendency was there to the formation of scar-tissue, and the better would the hearing be. If cases were carefully selected and Mr. Marriage's procedure adopted, grafting was probably better than not grafting, provided one could be certain that the graft would take.

Mr. J. S. FRASER (Edinburgh) sent a contribution describing his method of applying a graft from the skin covering the mastoid process to the facial spur at the end of the radical mastoid operation, in order to counteract the tendency to a drooping of the auricle after the mastoid operation. The whole procedure added only five minutes to the time occupied by the radical operation.

Dr. DAN MCKENZIE said he had performed Ballance's graft operation for four years, but it could not be expected to transform the difficult and tedious mastoid operation into a satisfactory one. Still, he thought it did shorten the period of the patient's convalescence.

Dr. DUNDAS GRANT said he had not done grafting as a routine, but he had carried it out in many cases and had never regretted doing it, though in some he regretted his omission of it. In one patient the mastoid on both sides had to be operated upon, but for a particular reason grafting was done on only one side. The hearing on the grafted side was much better than on the other.

Mr. STUART-LOW expressed himself, after some experience with the procedure, as not in favour of grafting. With care he obtained as good results without it. He described his methods, scrupulously avoiding any curettage of the inner wall owing to the subsequent formation of scar-tissue. There was danger of infection of the meatus after grafting.

Mr. MARRIAGE replied.

[1] THE LANCET, August 17th, 1 2, p. 428.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

Paratyphoid Infections.—Cirrhosis and Fatty Liver Showing Primitive Tubular Arrangement of Epithelium.

A MEETING of this section was held on Oct. 29th, Professor E. J. MCWEENEY, the President, being in the chair.

The PRESIDENT, after expressing his thanks for the honour conferred upon him by the Section of Pathology in calling him to preside over their meetings, gave an account of a case of Acute Gastro-enteritis due to Bacillus Paratyphosus B. The patient, aged 24, died after five days' illness, the leading features being profuse diarrhœa, severe pains in the stomach, vomiting, and collapse. On admission he was pulseless and died within 12 hours. He had suppression of urine, and his aspect was suggestive of the algid stage of Asiatic cholera. At the necropsy the only changes of importance were in the gastro-intestinal mucosa, which was dark-brown in colour, very rugose, thickened, velvety, and intensely injected. The changes were particularly marked in the stomach, which contained a little bloody mucus. The intestines were practically empty; no ulcers, Peyer's patches not altered. Non-lactose-fermenting organisms, identical culturally and serologically with B. paratyphosus B, were obtained from the bowel contents. The patient's friends ascribed his illness to eating fried fish. There were no other cases. The case showed that B. paratyphosus B could, like other members of the Gaertner group, produce typical food poisoning of the severest type.

The PRESIDENT also exhibited the new standard agglutination apparatus issued from the Department of Pathology,

Oxford University, on behalf of the Medical Research Committee.[1] In his opinion the apparatus was the best means hitherto devised for quantitatively estimating the agglutinating power of a serum and for distinguishing between typhoid and paratyphoid.—Dr. W. BOXWELL said he had met a somewhat similar case in a patient, aged 12 years, in which a proteus organism was isolated from the stools. The blood gave a negative Widal to typhoid, but agglutinated the proteus in 1 in 100 in ten minutes. The case ultimately proved fatal.—The discussion was continued by Dr. T. T. O'FARRELL, Dr. J. T. WIGHAM, Dr. J. M. DAY, Dr. W. D. O'KELLY, and Dr. STOKES.—The PRESIDENT, in replying, said that no cases of proteus food poisoning had come under his personal notice, though cases had been recorded in continental literature. He did not consider the agglutination test as applied to proteus in any way reliable. He had found simple plating of fæces quite satisfactory. He recommended that the fæces should be cultured when quite fresh, using five or six plates so as to obtain few discrete colonies and allow of the non-lactose-fermenters to be readily picked out. He had observed that fresh fæces produced but few liquefying colonies on gelatine. He stated that paratyphoid B, Gaertner, and B. suipestifer had many properties in common—viz., motility+, glucose+, lactose−, indol −, dulcite +. The serological differences were well marked; the complement-fixation test was also of value. He was pleased to hear the satisfactory results obtained by Dr. Day with the naked-eye agglutination test, as he had considered the microscopic the quickest and most reliable method until he had taken up the new standard method.

Dr. BOXWELL read notes of two cases of Paratyphoid. 1. A young man, aged 20, while out camping in September drank grossly contaminated water. He and two companions were the only members of the party who drank it unboiled. One hot day they drank it out of the same water-bottle, and all three fell ill about ten days later. One was too ill to move; one went to Cork Street Hospital, where Dr. Day diagnosed the condition on clinical and serological grounds; and the third went to Meath Hospital. Clinically this latter case was a fairly sharp attack of typhoid fever. 2. A woman, aged 40, admitted as a case of acute gastric ulcer. Her attack was ushered in by almost sudden bilious vomiting; later copious hæmatemesis. The latter continued off and on, with some bleeding from the bowel, for nearly a week. High fever developed (104·8° F.), a dry glazed tongue—not furred—and great weakness and lividity. She had a violent gastro-enteritis, suggestive of food poisoning, but no cause was discovered. Fever periodic; later a few rose spots and enlarged spleen. In both cases the correct diagnosis was established by Dr. John Speares, of the Pathological School, Trinity College. B. paratyphosus B was isolated from the fæces by the brilliant-green and Endo methods; and the organism was clumped in high dilutions by the patient's serum. The blood in both cases was negative to B. typhosus and B. paratyphosus A. In the first group the diagnosis was further confirmed by Professor McWeeney, who tested the serum against a strain of the bacillus isolated from his own case, while Dr. Speares had no difficulty in recovering B. paratyphosus B from the Cork Street case, a sample of whose fæces was sent for examination by Dr. Day. All three cases made a good recovery. Dr. BOXWELL, with regard to the difficulty in coming to a diagnosis in the case of an inoculated person subsequently exhibiting typhoid symptoms, stated that Professor Delépine had isolated a strain of typhoid bacillus, designated as 7120, which clumped with the serum of an active case of typhoid, but not with the serum of an artificially inoculated person. As to zone reactions, they were of such rare occurrence (1 per cent.) that they could almost be neglected in the first elimination of negative cases in a large series.—The PRESIDENT said that from recent experience he considered that paratyphoid infections were of much more frequent occurrence than had hitherto been generally supposed. He did not attach much importance to the methylene-blue reaction.—Sir JOHN MOORE testified to assistance obtained from the test, and Dr. BOXWELL, in reply, said that though the reaction was not claimed to be other than a rough "bedside test" it had given very satisfactory results.

Professor J. A. SCOTT read notes on a case of Cirrhosis and Fatty Liver showing Primitive Tubular Arrangement of the Epithelium, which was commented on by Dr. BOXWELL, Professor A. E. METTAM, and the PRESIDENT.

[1] THE LANCET, Oct. 9th, 1915, p. 837.

Reviews and Notices of Books.

The Individual Delinquent: a Text-book of Diagnosis and Prognosis for all Concerned in Understanding Offenders.

By WILLIAM HEALY, A.B., M.D. London: William Heinemann. 1915. Pp. 829. Price 21*s*. net.

THE Psychopathic Institute of Chicago, of which Dr. Healy is director, was established in 1909 through the munificence of a wealthy American lady, Mrs. Dummer, to provide for the systematic investigation of the mentality of young offenders coming up for trial before the Juvenile Court. Mrs. Dummer furnished the necessary funds for carrying on this work for five years, and at the end of that time the results of the experiment had so favourably impressed the judicial authorities that official status was accorded to the Institute, and it is now definitely established as a department of the Juvenile Court with a State grant for maintenance. This formal admission of psychology into the sphere of legal procedure is an important event in the evolution of criminology, and much credit is due to Dr. Healy and his fellow-workers who, by the evidence they have given of its practical utility, have had the largest share in bringing about this notable reform.

The success of the Psychopathic Institute which has been proved in this striking manner may be taken to show that Dr. Healy possesses in a large measure the capabilities of an organiser and an acute man of affairs; but these qualities do not appear, if we may judge from the present volume, to be combined in his case with the special aptitudes that are needed in the writer who undertakes to produce a comprehensive treatise on so difficult and complex a subject as the psychology of the criminal. Whether considered as such a treatise, or simply as a presentation of the results of personal research, Dr. Healy's book is unsatisfactory. It is faulty in both style and matter. The style is diffuse and occasionally pompous, and the reader's patience is further tried by the author's tendency to the needless repetition of trivial comments and statements of the obvious. For instance, after an indication of the fact that physical defects are disadvantages to those who suffer from them, the author proceeds later to labour the point by announcing that "the varying conditions of hearing which arise from middle-ear infection and otorrhœa are notoriously irritating," with much more to the same effect. Again he writes that "it should be easy for anyone to believe that such an affliction as deaf-mutism might lead to extreme recalcitrancy ....." The omission of superfluous matter of this sort, and a general pruning of irrelevancies and of platitudes, would have left a volume of reasonable proportions, in which it would have been less difficult to discover what really new facts and arguments Dr. Healy can bring to the discussion.

Essaying that task with the book as it stands, we find that the point on which the author lays most stress is the necessity of full and detailed inquiry into all the elements, personal and environmental, in each particular case; such an inquiry, as he remarks, shows always a considerable complexity of causation, but he claims, nevertheless, that by working on his lines it is possible to arrive at a confident opinion regarding the relative importance of the several factors that have determined the anti-social

conduct of the individual delinquent. This is, of course, the main object in view in all clinical studies of the criminal, and if Dr. Healy is able to feel so much more certain as to the value of his results than the majority of observers are wont to be, it is natural to assume that he has something new and effective to show in the way of methods. This does not, however, seem to be the case. He mentions, indeed, a number of mental tests which he has himself devised, and several of which seem to be ingenious and likely to prove useful; but these do not differ in principle from the familiar methods of estimating intelligence, and the intelligence is after all the least obscure aspect of the criminal's mind.

Apart from these tests Dr. Healy offers us no new aids to investigation. He arrives at his conclusions by the very old and fallacious method of arbitrarily selecting one out of the many factors in the history of the case and assigning to it the highest degree of influence, the other factors being then graded according to his estimate of their importance as contributory causes. A more systematic air is given to these judgments by expressing them on elaborate "causative factor cards," of which a very large number are scattered through the volume; but this mode of presentation does not give the conclusions any more value than they possess as the considered opinions of the observer who has investigated the case, and the reader can only judge of their soundness by referring to the detailed record on which they are based. It is the great merit of the minute reports of the physical and mental examination of criminals, which are published in such abundance by Continental and particularly by Italian observers, that such control by the reader is always easy; and Dr. Healy, who does not seem to be familiar with this literature, would be well advised to imitate this minuteness of clinical record. As it is, he gives only very vague and imperfect summaries of his illustrative cases, from which it is quite impossible for the reader to decide whether the facts do or do not justify the very positive diagnoses and prognoses. This is the more to be regretted, because some of the factors to which Dr. Healy attributes special importance have not usually been considered as prominent causes of crime. It is surprising to learn, for instance, that amongst juvenile offenders "a prolific source of delinquency arising from home conditions is the use of bad language on the part of parents."

We have advisedly dwelt more on the defects than on the merits of Dr. Healy's book, not only because these defects are unfortunately far more numerous, but also because the author's position may tend to invest his views with a certain authority; and in the present developing state of opinion regarding the problem of crime and the treatment of the criminal there is no more serious risk to the cause of scientific criminology than that it should be discredited by careless, hasty, or unsound work, as may easily ensue if such work is allowed to pass as representative of its best achievement. An appendix of 17 pages purports to give a bibliography of the subject; we observe that it does not contain any reference to Maudsley amongst English writers, to Prosper Despine or to Manouvrier amongst the French, or to Ferri amongst the Italians; there are some inclusions as remarkable as these omissions: a volume of essays on "Le Fétichisme dans l'Amour" is attributed to—of all imaginable authors—the late M. Alfred Binet!

Married Women's Work.

Being the Report of an Inquiry undertaken by the Women's Industrial Council. Edited by CLEMENTINA BLACK. London: George Bell and Sons, Limited. 1915. Pp. 292. Price 2*s.* 6*d.*

"WE can only say that the report presents the true conditions of some thousands—probably many thousands—of married women's lives in Great Britain in this earliest quarter of the twentieth century." This, the last sentence of Miss Clementina Black's introduction to "Married Women's Work," sums up what is attempted and what is achieved in this volume; and it is no mean achievement. To present "true conditions" is not easy; if the object is to set down facts, a dreary tale of unilluminating figures is too often the result; if, on the other hand, an attempt is made to convey the spirit of the lives of the poor, sentimental generalisations are usually the outcome. This publication of the Women's Industrial Council has, within the limits which are set for it, much of the accuracy of a blue-book combined with the human interest of a novel by a real observer of life as it is.

Certain facts emerge from the different documents with notable unanimity, and the most obvious and most depressing of these is the under-payment of large numbers of the men and of almost all the women of the families dealt with. It is, of course, often *because* of the under-payment of the man that the woman wishes to work, and the higher the standard of comfort and decency in the home and the greater the parental love for the children, the greater will be the incentive to work in the mother. "You cannot keep yourself respectable and your family as it should be on that without going out" (p. 113). This was said by a woman living in London who earned 7*s.* a week charing to supplement the £1 a week earned by her husband. A Leicester woman works to pay the rent of a larger house than her husband's wage could afford, so that her boys and girls may have separate rooms "to keep them respectable." Such phrases occur again and again, and we agree with Miss Margaret Skinner that such cases show sufficiently that all attempts to determine how often the woman's wage is not definitely necessary" are useless. Miss Skinner continues (and this brings us to a further fact which emerges): "By counting the numbers of neglected homes and well-managed homes, we discover that the wage-earning woman is just as likely to be a good housekeeper as not." This is borne out by examples taken haphazard, and practically all the contributors to the report bear this verdict out by similar facts.

With Miss Black's suggestions for remedies everyone will not agree, but with the spirit in which they are made few will be out of sympathy. It is this spirit which, permeating the whole book, makes its chief value. It is the spirit of experienced inquirers who have drawn certain conclusions after ascertaining certain facts, who are intensely sympathetic towards the workers dealt with without ever being slushy, who provide chapter and verse for their statements, both in the text and by means of very complete appendices, without making the statistics the object of the book.

Though such a book has, of course, a particular interest to the social worker, it is by no means only to such that it should appeal. Its value for reference parposes is intensified by a good bibliography and a first-rate index.

Mortality Laws and Statistics.

By ROBERT HENDERSON. London: Chapman and Hall. 1915. Pp. 110. Price 5*s.* 6*d.*

Mr. Robert Henderson is the actuary to the Equitable Insurance Society of the United States, and this book is apparently intended mainly for actuarial students, who will find in it, in a compendious form, much of the statistical information required by entrants to that profession. The section on the construction and graduation of mortality tables deserves study, especially that part of it which deals with the graphic representation of statistics. For the purposes of medical and public health students this work does not seem to possess superior claims to those of the well-known treatises on Life Table construction issued by Dr. Farr and his successors at Somerset House, or to those of Mr. George King and a few others in this country. This book is well printed and published at a reasonable price, and will doubtless be appreciated by those for whose benefit it has been designed.

Applied Anatomy: The Construction of the Human Body considered in relation to its Functions, Diseases, and Injuries.

By GWILYM G. DAVIS, Pennsylvania. Third edition. With 631 illustrations. London and Philadelphia: J. B. Lippincott Company. 1915. Pp. 630. Price 24*s.* net.

IN reviewing the first edition of this work we expressed the opinion that the book was a useful one, and we noticed some minor features which appeared to us to merit some correction or alteration.[1] We are glad to note that most of these minor defects have been remedied; but as a note of exact criticism, which we see no reason for withholding from any work dealing with precise anatomy, we may observe that the epiphyseal line of the tibia is still depicted incorrectly (Fig. 554).

We repeat with pleasure our former opinion as to the utility of the book, and we congratulate the author upon the appearance of this third edition.

CURRENT GERMAN MEDICINE.

IN this column will be given brief notes and summaries from contemporary German and Austrian medical literature as far as this is available.

Bacteriology.—Professor Asch, of Strasburg (MmW39[2]), has described *degeneration forms of the gonococcus*, two to five times the diameter of the usual form, showing scarcely any sign of division and becoming increasingly Gram-positive as degeneration proceeds. Evidence that these really are gonococci at all is afforded by the fact that a "provocatory" injection of gonococcus vaccine will bring the normal form again to light.

Dr. R. Kraus and Dr. B. Barbará, of Buenos Aires (WkW38), state that water, milk, or curative serum can be simply and rapidly *rendered sterile* by shaking with *animal charcoal* and filtering. In the case of milk a 3 per cent. addition of charcoal suffices if allowed to stand for 15 minutes. A practical method for treatment in bulk is being elaborated. In the case of curative serum it was shown that the charcoal did not remove any antibodies.

Drugs.—The Pharmacological Institute of Vienna (WkW38) has notified the probability that the following *drugs may run short* in civil practice: digitalis, of which the leaves of D. purpurea are to be replaced by those of the yellow varieties; camphor, which is to be reserved for hypodermic use; senega, to be replaced by quillaia and saponaria; morphia, to take the place of which the synthetic papaverin is to be used as far as possible [N.B.—There is some doubt if Turkish opium is available or not]; ol. ricini, aloes, senna, jalap, to be replaced by phenolphthalein, $MgSO_4$, and cascara; iodine, its place to be taken in skin disinfection by the cheaper bromine; boric acid, replaced by other antiseptics.

Professor Unna sees a probability (BkW40) of a *lack of glycerine* during the war. He suggests that its properties can be imitated by syrup or 4 per cent. $CaCl_2$, or a mixture of both.

The German War Office states (MmW37) that there is now sufficient raw material for *dressings*, and forbids the preparation of charpie for this purpose.

Neurology.—Professor Weygandt, of Hamburg, contributes interesting notes (MmW37) on the assessing of *mental affections* in war. Unexpectedly large has been the number of cases of epilepsy and hysteria among the soldiers at the front. The stress of war may produce epileptic fits and light up again an epilepsy long regarded as extinct. Three-fourths of the cases had previous epileptoid disturbances, and one had gone through campaigns in Belgium, France, Russian Poland, and the Carpathians before fits and twilight phenomena began. One had had unilateral convulsions at the age of 1½, 6, and 8 years and a series of losses of consciousness at 7 and 11 years, but nothing further until the events at Louvain produced depression resulting in twilight condition some weeks later. Another had convulsions in early youth and nothing further except some alcoholic intolerance. In February, aged 31, he was called up and in May sent into the trenches. He survived three periods of ten days each, and then had a nocturnal attack with convulsions and tongue-biting; since then he had remained well. Some of the epileptics recover sufficiently to return, and a promise of garrison work is an aid to recovery. Campaign hysteria is very common, and the prognosis is good. War maladies in the narrower sense are cases of psychical shock and of severe exhaustion with psychical disturbance. One confirmed neurasthenic with dementia præcox in his immediate family, who had himself been several times in a nerve sanatorium, came to grief suddenly on night patrol, and was at first regarded as quite hopeless, but after 11 weeks' institutional treatment was fit for garrison work, and afterwards returned to the front quite well. Realising that Germany needs all available men, Professor Weygandt advises a revision of the notion of absolute military unfitness of psychological abnormality. Many of the cases of shock, exhaustion, or hysteria, and even epileptics and others, can recover sufficiently for garrison work, and on some of the cases of hysteria service may have a favourable influence.

Obituary.—Professor Karl Anton Ewald died in Berlin, from lymphatic leukæmia, at the age of nearly 70. He was for 30 years head of the medical clinic in the Augusta Hospital, Berlin, and was best known for his work on diseases of the alimentary canal. From 1881 to 1907 he edited the *Berliner klinische Wochenschrift*, part of the time in association with Posner, and for many years was librarian of the Berlin Medical Society. His disposition was a little hard, and his rather extraordinary lack of feeling for his associates and colleagues often aroused ill-feeling against him, but he was constantly active in philanthropic work—e.g., he was for more than 30 years secretary of the Children's Marine Convalescent Homes. His mentality was unclouded to the end, and he occupied himself continuously with literary work. (MmW39, &c.)

THE PROPOSED NEW DRUG TARIFF: ACTION OF THE ABERDEEN CHEMISTS.—A fully attended meeting of the panel chemists in Aberdeen was held on Nov. 19th, when the situation created by the proposed institution of a new drug tariff for the payment of chemists was under discussion. After a full discussion the following motion was unanimously carried:—

That in view of the action of Mr. Charles Roberts, M.P., in rejecting the offer of Scotch panel chemists for 1916, and his indicating that a new drug tariff would be enforced on July 1st, 1916, this meeting of chemists resolves to send in their resignation to the Local Insurance Committee as from Dec. 31st, in accordance with the resolutions adopted by the General Council of Panel Chemists (Scotland).

The meeting proceeded to make arrangements to carry the resolution into effect. A similar meeting was held on the same day in Banff, at which the same decision was reached.

[1] THE LANCET, March 25th, 1911, p. 814.

[2] MmW39 = Münchener medizinische Wochenschrift, No. 39. WkW38 = Wiener klinische Wochenschrift. BkW40 = Berliner klinische Wochenschrift.

THE REPORT OF THE MEDICAL RESEARCH COMMITTEE.

II.[1]

BEFORE the outbreak of war this Committee reviewed the directions in which it appeared most desirable to initiate or to encourage research work for the improvement of medical knowledge; they acquainted themselves thoroughly with the resources, both personal and material, of the universities and other centres of medical research throughout the kingdom, visiting themselves nearly all these centres, and when war was declared were just completing a scheme, framed with estimates of expenditure, for submission to the chairman of the National Insurance Joint Committee. In spite of the war the scheme was able to come before the Advisory Council which, it will be remembered, was the body of 42 members set up by the Joint Committee to advise their chairman, on Nov. 17th, 1914, and was subsequently, with slight addition, approved by the Minister. This was the peace scheme of research, but it was at once apparent, as the Committee pointed out, that as the war continued the research work organised with a view to peace conditions was likely to diminish and the special work undertaken in connexion with the war to increase progressively, and the Committee began at once to find occasion for the rapid organisation of pathological work in connexion with military objects and for safeguarding the health of the forces. For these emergency schemes approval was obtained from the chairman of the Joint Committee without reference by him to the Advisory Council.

GENERAL SCHEMES FOR RESEARCH.

Of the research schemes finally approved the following have actually been initiated, and it will be seen that some of those begun have been subsequently postponed.

Tuberculosis.

For the investigation of special bacteriological problems Professor J. Ritchie at Edinburgh has been provided with a whole-time chemical assistant for the study of the chemical influences determining virulence and other characters of tubercle bacilli (*pp*)[2]. At Manchester, and later in London, Professor A. E. Boycott has been provided with a whole-time assistant for his work upon the chemical conditions of bacterial growth with special reference to tuberculosis. At Cambridge Dr. A Stanley Griffith has been able to extend his studies upon the attenuation and mutations of type of the bacillus. At Dublin, under Professor E. J. McWeeney's direction, Dr. W. D. O'Kelly has given whole-time work to the investigation of the types of bacilli in surgical tuberculosis of children. At Midhurst Dr. N. D. Bardswell has been provided with clerical and visiting assistance for his work in following the after-history of cases treated with tuberculin at the King Edward VII. Sanatorium. Similar work coördinated with this has been done at the Alton Hospital, under the direction of Mr. H. J. Gauvain. At Edinburgh, under the direction of Professor J Lorrain Smith, and with the collaboration of Sir Robert Philip, Dr. James Miller gave part-time to work upon the effects of graduated doses of tuberculin (*pp*). In London Dr. Teale has been provided with assistance for work on the relations of antitryptic ferments to the conditions of tuberculous infection. Dr. Crofton, in Dublin, worked upon the chemotherapy of tuberculosis (*pp*). A special investigation committee was appointed to deal with the incidence of phthisis in relation to particular occupations. Its members were: Dr. Addison (chairman), Dr. Hill, Dr. Moore, and Dr. Brownlee, of the committee's scientific staff, Dr. E. L. Collis, medical inspector of the Home Office Factory Department, with Dr. W. M. Fletcher. This committee has inquired into the incidence at certain selected centres of industry—namely, Birmingham, Bradford, Leicester, Manchester, Sheffield, Cardiff, and Belfast. With the coöperation of the medical officers of health for those boroughs, the committee is collecting for statistical analysis the returns of phthisis in factory workers, correlated with particulars supplied by the tuberculosis visitors. In a report the possibilities and advantages of a sanatorium in which patients might be provided with work at their own trade, regulated in amount by their physical condition, are discussed. A second report, upon phthisis in the printing trade, is in course of preparation.

Rickets.

At Glasgow an important scheme of work has been arranged and generally directed by Professor Muir and Professor D. Noel Paton, which includes an attack upon this disease along separate lines of inquiry. Systematic social and dietary investigations in the city have been organised, and these are being conducted by a band of voluntary workers. Dr. Madge Robertson has received a grant for assistance in the medical superintendence of this visiting work. At other centres an attempt has been made towards the systematisation of hospital dietetic records with regard to children developing rickets—Professor I. Walker Hall at Bristol; Dr. H. C. Corry Mann at the Evelina Hospital (*pp*). In London, Dr. J. A. Gardner has studied the absorption of cholesterol and its distribution in the body in rickets. Mr. H. G. Plimmer has kindly assisted this work by supplying occasional material from the Zoological Gardens. At Cambridge Mr. F. B. Winfield has given whole-time work under the direction of Professor F. G. Hopkins to the study of the unknown but recognisable factors in diet determining growth without apparent relation to energy supply.

The Hygienic Relations of Milk.

The committee invited Dr. Janet Lane-Claypon, assistant medical inspector to the Local Government Board, to prepare a monograph and critical review of the existing international literature upon the hygienic relations of milk, in extension of her special reports upon parts of the subject which have already been published. It is proposed to issue the work in a convenient and saleable form, and there is reason to think that the receipts upon sale will make the final cost of publication negligible. The Committee attach importance to this project, and it is hoped that monographs upon other special subjects may be produced in a series. Dr. Lane-Claypon's work is nearly ready for the press. At Birmingham preliminary work under the direction of Sir Oliver Lodge and Professor R. F. C. Leith upon the electrical purification of milk has been begun (*pp*). At Reading Dr. R. Stenhouse Williams is conducting an important inquiry into the persistence in pasture lands of tuberculous infection caused by infected cattle. At King's College, London, Professor R. T. Hewlett and Mr. C. Revis have reinvestigated some points in connexion with the cellular elements of milk.[3]

Rheumatic Infections.

At Bristol Dr. Carey Coombs began work upon the bacteriology and morbid histology of rheumatic infections (*pp*). Work upon experimental rheumatic infections was undertaken by Professor Beattie, together with similar work at Reading by Dr. Donaldson (*pp*).

Diseases of the Nervous System.

At Cardiff Dr. A. J. Howell has studied the microchemistry of the cerebro-spinal fluid, and Dr. R. V. Stanford has worked at the improvement of microchemical methods of analysis and their adaptation to the study of the cerebrospinal fluid in pathological conditions. Dr. F. Sano, of Antwerp, has given whole-time work to the study of lesions of the brain, especially those of the speech-centres, working at the Claybury Asylum laboratory under the direction of Professor Mott.

Chronic (Rheumatoid) Arthritis.

This disease has been the subject of special study by Mr. T. S. P. Strangeways at the research hospital equipped for the purpose at Cambridge by voluntary subscriptions. The Committee had hoped to support a development of the work here in the direction of surgical treatment, but from the beginning of the war the hospital has been lent to the War Office for the accommodation of wounded officers. A report upon this recent work is now ready for publication.

Dust Inhalation and Pulmonary Disease.

The Committee have taken part in a general scheme of research which was arranged in consultation with represen-

[1] The first article on the Report of the Medical Research Committee appeared in THE LANCET of Nov. 13th, p. 1100.

[2] Where the work has been postponed on account of the war the letters (*pp*) are placed after it.

[3] THE LANCET, April 24th, 1915, p. 855.

tatives of the Home Office and coördinated with work already undertaken in special directions on behalf of a committee of South African miners. The part taken in the joint scheme by the Committee has been the subvention of work, arranged in consultation with Dr. J. S. Haldane, at Liverpool, Oxford, Stoke-on-Trent, Derby, and St. Helens.

Diseases of the Heart.

The development of cardiographic studies under Dr. Thomas Lewis at the University College Hospital, London, has provided an obvious opportunity for coördinated work at this centre. The Committee arranged to provide a medically qualified assistant giving part-time work, and to make a further grant to the support of the cardiographic department. A grant was made to Professor E. H. Starling for the provision of optically recording apparatus to be used at University College in physiological work correlated with the clinical work carried on at the hospital.

Work has also been done upon oral sepsis, diabetes, anaphylaxis, and various general pathological researches.

WORK IN CONNEXION WITH THE WAR.

At the outbreak of war it became obvious to the Committee that they were charged with the administration of State resources for scientific and medical work which ought, as a matter of course, to be placed freely at the disposal of the National Executive, and especially of the Army Medical Department, for suitable use in connexion with problems arising out of the war. Upon the formation of the large new armies, many questions relating to their health became problems belonging to the welfare of the country at large. The special circumstances of war have been found in experience to give unequalled opportunities for study and research, of which the outcome may bring lasting benefits to the whole future population.

As has been noticed already, the Mount Vernon building at Hampstead, with its grounds, has been lent to the War Office for use as a Military Hospital, and the resources of each of the four scientific departments have been employed for special war work. Of this work the largest and most costly single undertaking has been the compilation of the medical statistics of the war on behalf of the Army Council.

Pathological Work at Military Hospitals.

In the rapid mobilisation of the General Territorial Hospitals the arrangements made for the service of pathologists and the equipment of pathological laboratories in the hospitals were not in all cases adequate at the beginning. The Committee therefore offered to assist the War Office by making additional provision, so far as possible, for pathological work at all the military hospitals needing it. These needs were found to vary widely in different places, both in character and amount. At some of the large Territorial hospitals complete arrangements had been made for routine pathological and bacteriological work; at others practically none. In general, where officers had been commissioned for this work, grants were made by the Committee for the better equipment of laboratories and for the supply of apparatus not found in the current War Office list for requisitions, or of special apparatus for particular purposes outside the common routine of hospital work. At many of the centres grants have been made for part-time work by pathologists without commissions, whose work in some cases is carried out in adjacent laboratories belonging to university or other bodies. In certain cases the Committee have equipped special laboratories within military hospitals for the purposes of routine work, or for the conduct of special inquiries, or both.

In several cases the Committee were able to bring to commanding officers offers of voluntary work or of laboratory accommodation made by neighbouring pathologists, and in many cases the fact that the question of pathological work had been raised was followed subsequently by the appointment of commissioned officers to duty as pathologists, and the first provision of pathological laboratories. It appeared to the Committee that it was useless and undesirable to attempt to draw a line between routine work and special research work, and that it was not improper to assist the former from the Medical Research Fund. Apart from the military exigencies of the time, routine work in proper hands may be expected very often to suggest and to give an opportunity for research work.

The Committee invited Colonel Sir William Leishman, one of their members, to indicate in his capacity of adviser in pathology to the British Expeditionary Force the chief directions in which it appeared desirable that special inquiries should be at once instituted, and a memorandum containing his suggestions was drawn up and circulated to all the suitable research centres. Many of the questions raised in the memorandum were selected by particular pathologists and made the basis of immediate work. The results of these investigations have been communicated to him from time to time, and reports have also been obtained from expert sources upon particular questions when need has arisen.

The following researches upon special subjects have been arranged or assisted by the Committee.

Special Inquiries: Antiseptics.

No subject for research has seemed of more urgent importance than that of the pathology of infected wounds considered with a view to their effective treatment. It is not an exaggeration to say that the recent experience of septic wounds inflicted under the conditions of the European battlefields has revealed previously unsuspected difficulties in treatment which the resources of modern surgery have not been able to overcome. Sir Almroth Wright, with his staff supplied by the Committee at Boulogne, has directed the chief part of his work to the study of infected wounds and their treatment. His work is still in progress. Meanwhile, the treatment of wounds by a hypertonic salt solution without antiseptics, to which his work drew attention, is being extensively used in practice and is giving results regarded by many as superior to those obtained by the ordinary use of antiseptics. The Committee, however, have also supported further inquiries into the actions, experimental as well as clinical, of particular antiseptics and of new preparations of antiseptic value.

At London the Committee have provided work by Dr. P. Fildes and by Dr. L. W. Rajchman upon the bactericidal powers of certain antiseptics, and in particular those of preparations of malachite green and mercuric salts, in collaboration with Surgeon-General G. L. Cheatle, who made the parallel clinical observations at Haslar.[4] At Edinburgh an investigation has been carried out by Professor Lorrain Smith, assisted by Dr. A. Murray Drennan, Dr. Rettie, and Dr. William Campbell, into the antiseptic actions of hypochlorous acid.[5] Quite independently of this work at Edinburgh, another set of observations upon hypochlorous acid as an antiseptic was instituted at Compiègne by Dr. Dakin,[6] who has now proceeded on behalf of the Admiralty to the Mediterranean, and will be given exceptional opportunities for applying and reporting upon the methods which have already given good results in France and in this country. The Committee are hoping to obtain reports from surgeons and bacteriologists at many military hospitals, who have undertaken to apply and estimate in practice the results of these several inquiries made on behalf of the Committee.

Typhoid and Paratyphoid Infections.

At Manchester the Committee have supported a special investigation in Professor S. Delépine's laboratory by Dr. Dawson, upon the methods of diagnosing typhoid infections in previously inoculated men.[7] At Oxford during the early months of the war, Professor G. Dreyer, with Captain E. W. Ainley Walker and Captain A. G. Gibson, studied the same problem of distinguishing between the reactions of inoculated men and those in cases of fresh active infection, and have used Professor Dreyer's macroscopic agglutination method.[8] This work was continued by Professor Dreyer in France and applied by Dr. A. C. Inman in hospitals at Wimereux.[9] The method has now been adopted widely both at home and abroad, and the Committee have established at Oxford, under Professor Dreyer's direction, a department for the necessary standardisation, and have arranged for the supply of emulsions and sera to military hospitals, together with the simple apparatus needed for their use in agglutination tests and in the measurement of agglutinative values. Standard cultures and sera, with apparatus, have already been supplied upon request to upwards of a hundred military laboratories in this country

[4] THE LANCET, July 24th, 1915, p. 165.
[5] Brit. Med. Jour., July 24th, 1915.
[6] Ibid., August 28th, 1915.
[7] Ibid., July 24th, 1915.
[8] THE LANCET, Feb. 13th, 1915.
[9] THE LANCET, July 31st, 1915.

and abroad, and it is hoped that their use will not only aid the diagnosis and study of typhoid and paratyphoid (A and B) infections, but also allow accurate comparisons to be drawn between the records of observations made by various observers in different places at different times. This unification of records may be expected to add greatly to the general value of the large volume of work upon these infections now being done.

Cholera Expedition to Galicia.

Dr. John Freeman, with an interpreter, was sent by the Committee in the autumn of 1914 to Galicia in order to investigate the various strains of cholera infection, endemic or epidemic, in that district, and to bring to this country cultures of the chief strains. It appeared important to the Committee that these strains should be available for the preparation of vaccines in view of the possible eventuality of a transference of infection to the Allied Forces in the western theatre of war. The results of the expedition were placed at the disposal of the Inoculation Department of St. Mary's Hospital, which has been able already to supply large quantities of anti-cholera vaccines to the Serbian Government and to the British Forces in the Mediterranean area.

Bilharzia Expedition to Cairo.

The Committee have coöperated with the War Office and with the London School of Tropical Medicine in sending an expedition to Cairo to apply the results of recent discoveries with regard to the life-history of bilharzia, and to extend them by the investigation of the species of bilharzia which is endemic in the Nile delta. In certain districts here from 80 to 90 per cent. of the native population are infected and are a potential source of danger to other persons. The expedition had for its immediate practical object a settlement of the best prophylactic measures to be taken for the protection of the military forces in Egypt, but it had in view also the complete investigation of the natural history of the primary infecting agents. The War Office provided temporary commissions for Dr. R. T. Leiper and for his two assistants, Dr. R. P. Cockin and Dr. J. G. Thomson. The expedition has been completely successful in its immediate purpose. Lieutenant-Colonel Leiper has succeeded in demonstrating that Egyptian bilharziosis cannot be directly communicated from man to man, but is only transmitted through a fresh-water snail, in which its alternate form is parasitic. The mode of infection has been followed experimentally with material taken from infected molluscs collected in the endemic area. Many fundamental revisions of hygienic practice will depend upon the new knowledge of the facts. A full account of the work done is now appearing in successive numbers of the *Journal of the R.A.M.C.* Dr. Dale is making experiments in the biochemical department with a view of finding therapeutic agents of curative value for the disease when once acquired.

Cerebro-spinal Fever.

In recent years there has been an epidemic of cerebro-spinal fever upon a small scale during the earlier months of each year in this country. Early in the present year the disease reappeared in the normal course and may also have been introduced independently by visiting troops. The concentration of large bodies of troops in billets and camps presented favourable conditions for the propagation of the disease, and the Committee, coöperating throughout with the military authorities, have given every assistance in their power for its investigation and the control of the epidemic. Dr. Mervyn H. Gordon was appointed by the Committee to organise and direct the bacteriological work done on their behalf, and has been engaged in important researches into the disease and the characters of the different strains of the meningococcus which have been isolated. Of this work a preliminary account has been published [10] and a further paper is in preparation. The Committee have also placed their research beds in St. Mary's Hospital at the disposal of the War Office for a special investigation by Dr. L. Colebrook, assisted by Dr. Tanner, into the sterilisation of positive contacts infected with the meningococcus. The results of this work are now ready for publication.

With a view to the coördination of the results of all the experience gained during the epidemic, and for the guidance both of the administrative measures which must be prepared for the probable outbreak in the early months of next year and also of future research, an advisory committee has been appointed consisting of Professor F. W. Andrewes (Captain, R.A.M.C., T.), Professor R. T. Hewlett, and Professor W. Bulloch, to consider and report upon the work which has already been published in connexion with the outbreak. They will prepare a critical summary of the work which has been done, and their report will be placed at the disposal of the military authorities.

Chemical Factors in Bacterial Growth.

At Millbank Lieutenant Davies began work with Major Gordon upon the chemical factors concerned in the growth of the meningococcus, and this work has been continued by Dr. F. E. Taylor at King's College, London. At Cambridge closely allied work was originated in the research laboratory of the Committee at the 1st Eastern Hospital, and will be continued by Mr. H. W. C. Vines. This will form part of a coördinated scheme of work under the general direction of Professor Hopkins, not confined to the study of the particular organism of cerebro-spinal fever.

Neurological Inquiries.

The Committee have assisted the War Office in arranging for the better coördination of the study and description by trained observers of the important groups of neurological cases at military hospitals. If the abundant observations now being made by skilled observers can be adequately recorded and collated valuable gains to knowledge must emerge, and these may be expected in the future to benefit directly the proper guidance of treatment in civil no less than in military practice.

In conjunction with workers abroad, nearly fifty neurologists in London and at the various provincial centres are now working upon a common plan, the Committee providing certain printed forms, diagrams, and apparatus. A card index is being compiled with reference to the full clinical records in individual hands. Notes upon the experience obtained by various observers have been circulated by the Committee and meetings of those engaged in the work have been held. In connexion with this scheme grants have been made for part-time work by several uncommissioned physicians for special assistance in the study of cases both of structural nervous injury and of functional nervous disorder due to physical concussion, mental strain, and other conditions.

Testing of Salvarsan Preparations.

Subsequently upon the outbreak of war the Board of Trade suspended the patent and trade marks of the drugs salvarsan and neosalvarsan in favour of two manufacturing firms. Licence was granted by the Board to Messrs. Burroughs, Wellcome, and Co. for the manufacture in this country of these preparations, which they sell under the names of kharsivan and neokharsivan, and to the Société Anonyme des Établissements Poulenc Frères of Paris for the sale, through agents in Great Britain, of the same products under the names of arsenobenzol-Billon and novarsenobenzol-Billon. The necessary safeguards against possible dangers can only be provided in the present state of knowledge by animal experiment, of which the result gives evidence of the total toxicity, from whatever source it comes. The Board of Trade licence in both the above cases, therefore, was granted subject to the condition that all samples of these drugs sold in this country should be submitted to biological tests by an authority approved by the Board. In the special emergency of the war the Medical Research Committee, at the request of the Board of Trade, accepted for the time being the responsibility of directing these biological tests. The tests are performed by experts approved by the Committee, and a certificate signed by the secretary of the Committee is issued to allow the sale of each batch of which samples have passed satisfactorily the proper tests. In the course of this work investigations have been made which give promise that improved technical methods for the performance of biological tests of the kind needed for this purpose may shortly be reached.

Acute Nephritis.

At the request of the Director-General, the Committee organised a special inquiry into a group of military cases of acute nephritis (epidemic dropsy). The committee arranged for the reception of cases in two of the military wards at St. Bartholomew's Hospital. These have been under the care of Captain W. Langdon Brown, whose clinical

[10] Journal of the R.A.M.C., May, 1915.

observations were correlated with bacteriological work supplied by the committee under the direction of Captain F. W. Andrewes.

Other subjects which have received careful consideration are dysentery, industrial fatigue and the health of munition workers, disorders of the soldier's heart, gunshot wounds of the chest, classification of anaerobic organisms, measles in military camps, skin-grafting of wounds, and X ray work at military hospitals.

Trench Frost-bite.

Special work has been done at Edinburgh for the Committee upon the pathology of "trench frost-bite," and the results have been published by Professor J. Lorrain Smith, Professor J. Ritchie, and Dr. James Dawson.[11]

Medical History of the War.

In addition to the general compilation of the medical statistics of the war and the special scheme already mentioned for the coördination of neurological work, the Committee have provided secretarial assistance and printing expenses in connexion with the collection and study of particular groups of cases in military hospitals. The information so obtained is likely to give results of scientific value beyond the military and historical purposes for which they will be made available for publication in the official medical history. At the same time, the mechanism for their collection has allowed the rapid supply of information to medical officers overseas with regard to the after-history of cases for whose treatment they are responsible in the initial stages. The chief subjects already dealt with have been gunshot wounds of the chest, arterial injuries, fractures of the femur, fractured joints, epidemic dropsy, and wounds of the abdomen.

With the permission of the Committee, their secretary has been appointed (honorary) joint secretary of the War Office Committee for the Medical History of the War.

CONCLUSIONS.

While the war has disturbed, and in many directions widely deflected their plans, it has nevertheless been a gratification to the Committee to find that the organisation which it has fallen to them to initiate, has even in its infancy been found directly applicable and useful to the special needs of the present time. The existence of the National Medical Research Fund, established by historical accident so shortly before the war and without any foreknowledge of it, has made it possible to bring auxiliary agencies rapidly to the service of Government departments, and especially to that of the Army Medical Department in its varied and vitally important activities. Sir Alfred Keogh, Director-General, A.M.S., has more than once made the most generous acknowledgment of this assistance, and the Committee on their part would desire to express their thanks to him for giving them repeated opportunities, not only of offering some service to the military forces, but also of using the occasions arising from immediate practical need, for inquiries of which, in many instances, the results seem likely to bring benefit, whether directly or indirectly, not only to the troops now engaged, but to the population at large.

In normal circumstances it would now be the duty of the Committee to recommend to the Minister new schemes of organised research for the coming year. So far as research work not directly connected with the war is concerned, however, the Committee cannot hope to proceed actively until the conclusion of hostilities is in sight. They have indicated already the directions in which normal research work has still been possible, notwithstanding the war, and they have recommended that so far and so long as these possibilities remain the continuation of these researches within the limits of the schemes previously proposed may be approved for a further year. On the other hand, the schemes of work undertaken for the War Office or other Government departments in connexion with the war must be expected to increase rather than to diminish.

The Committee have asked further that a provisional approval of the kind previously given may be given again with a view to their work in the coming year, in order that they may continue in the same way to bring the resources of the Medical Research Fund as effectively as possible to the fulfilment of the national requirements.

[11] THE LANCET, Sept. 11th, p. 596.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

DRY PEPTONOIDS (SOLUBLE).

(MESSRS. CARNRICK AND CO., LIMITED, 183, ACTON-VALE, LONDON, W.)

"Dry peptonoids" occur as a brown granulated preparation which is practically entirely soluble in water. Our analysis confirmed the statements made in regard to its composition and properties. We found it to consist of the hydrolysed and soluble products of beef, milk, and wheat. Thus there were present albumoses, peptones, lactose, glucose, and mineral matter rich in phosphates. The predigestion is evidently complete, inasmuch as dry peptonoids dissolve to a practically clear solution even in cold water. The taste is attractive, a malt flavour being more in evidence than anything else. Our analysis gave the following results: Moisture, 5·00 per cent.; mineral matter, 8·2 per cent.; proteins, 38·80 per cent.; and total sugars, 48·00 per cent. The preparation is one of distinct merit, and should serve as a rapid nutrient, especially in cases of digestion enfeebled by illness. Omitting fat, dry peptonoids on suitable dilution would show the same composition as milk.

PARAFFINUM LIQUIDUM B.P.

(1. MR. W. MARTINDALE, 10, NEW CAVENDISH-STREET, LONDON, W.)

(2. THE PRODUCE BROKERS COMPANY, LIMITED, 24-28, ST. MARY AXE, LONDON, E.C.)

(3. MESSRS. SNOWDONS, SONS, AND CO., LIMITED, MILLWALL LONDON, E.)

1. Two samples from Mr. W. Martindale were examined first of all in regard to the requirements of the British Pharmacopœia and then to viscosity, which we consider of primary importance, since these oils are intended as lubricants in the intestinal tract. Both samples showed the absence of sulphur compounds, the presence in negligible amounts of unsaturated hydrocarbons, a freedom from fluorescence, a colourless appearance, and a neutral reaction. Sample No. 1 showed a specific gravity at 60° F. of 0·884 and at 100° F. 0·869. The viscosity was 250 seconds, tested in the Redwood viscometer. Sample No. 2 showed a specific gravity at 60° F. of 0·876 and at 100° F. 0·860. The viscosity was 118 seconds. For medicinal purposes, which amounts to using these oils as intestinal lubricants, No. 1 is preferable to No. 2, though the latter shows a viscosity well above the line which we have laid down as effective.

2. In a communication which we have received from the Produce Brokers Company they write: "We are very interested in the article in your issue of Oct. 16th on 'The Nature and Quality of the Article Supplied to the Public,' and we quite agree with your remark—viz., that the supply of paraffinum liquidum to the public is not satisfactory." We have examined a sample of the oil submitted to us by this firm, and our analysis agrees substantially with theirs. The sample was free from colour, odour, and taste, and there was no sign of fluorescence. The specific gravity at 60° F. was 0·878 and at 100° F. 0·861. The viscosity measured in the Redwood viscometer was 129 seconds at 100° F. The

test for sulphur compounds gave negative results; the reaction was neutral, and the acid test for unsaturated hydrocarbons gave only the slightest indication. This oil conforms with the requirements of the British Pharmacopœia, while its viscosity brings it within the region of oils useful for lubricating the intestinal tract.

3. We have received from Messrs. Snowdens two samples of paraffinum liquidum which have been submitted in reference to the articles that we published on this subject. They are described as of genuine Russian manufacture. The results given by the first sample were as follows: Specific gravity, 0·887 at 60° F., 0·870 at 100° F.; viscosity (Redwood viscometer), 250 seconds at 100° F. There was exhibited a slight opalescence but no fluorescence. The oil was free from unsaturated hydrocarbons and the absence of sulphur compounds was ascertained by the lead test. Further, the oil was tasteless, odourless, and colourless, whilst its reaction was neutral. This oil satisfies the requirements of the British Pharmacopœia and, what in our view is of equal if not of greater importance, its viscosity renders it suitable as a lubricant for the intestinal tract. The second sample of oil gave a viscosity of 198 seconds by the same test, although its specific gravity was only a little below that of the previous sample—namely, 0·884 at 60° F. and 0·866 at 100° F. The response to the tests laid down by the British Pharmacopœia was satisfactory.

MACONOCHIE'S ARMY RATION.

(MESSRS. MACONOCHIE BROS., MILLWALL, LONDON, E.)

This ration appears to have maintained its favourable reception by the troops. The popularity of the savoury Irish stew, the preparation of which it extemporises, well accounts for this reception. Each tin contains ¾ lb. of fresh boneless beef together with potatoes, haricot beans, onions, carrots, and gravy. The preparation is simple. The tin is placed in boiling water for 20 minutes, after which it is opened and the contents are turned into a tureen, half a pint of hot water being added to the gravy, and the whole served hot. It provides a very palatable, attractive dish, nourishing and stimulating. We found the contents of the tin sound, and an examination for metal in the gravy gave a quite negative result.

DURALYSOL.

(THE CONNART CHEMICAL COMPANY, LIMITED, 4, LLOYD'S-AVENUE, LONDON, E.C.)

The convenience of an effective preparation of lysol in the form of a semi-solid so that it can be used from, and carried about in, a collapsible tube is obvious. That sums up the claims of duralysol. It is a translucent soft soap-like mass which dissolves in water to a perfectly clear fluid. We found that it contained 47·5 per cent. of creasols, the equivalent of 95 per cent. of lysol, which contains usually half its weight of creasols. The creasols were separated by eliminating the resins and soaps with a mixture of caustic soda and calcium chloride. The clear fluid obtained on filtration from this, on being saturated with salt and acidified with hydrochloric acid, sets free the creasols. This method deserves to be known more widely than it is, and was devised in THE LANCET laboratory. Lysol in this easily portable form will, we imagine, very generally be appreciated.

LYCRYL.

(EUCRYL, LIMITED, 61-63, LANT-STREET, SOUTHWARK, LONDON, S.E.)

Lycryl is a clear, dark brown fluid which readily mixes with water. It possesses both detergent and germicidal properties. It is, in fact, a combination of creasols, alkali, and soap. By treatment with caustic alkali and calcium chloride the soaps were precipitated and the phenoloids were then left combined with alkali. This combination is decomposed by the addition of hydrochloric acid, and the creasols set free. Separation is completed on the addition of common salt. In this way we found present exactly 50 per cent. of active germicide. The germicidal action of this preparation is, of course, facilitated by the ease with which it removes grease, mucus accumulations, and so forth.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE WEEK'S SUBSCRIPTIONS.

THE subscriptions to the Belgian Doctors' and Pharmacists' Relief Fund received during the week have been as follows:—

	£	s.	d.
Association of Medical Women in India (per Dr. Mary O'Brien)—Dr. Muller, Dr. Shave, Dr. Balfour, Dr. Bielby, Dr. Benson, Mrs. D'Monte, Miss Mehta, Miss N. Mehta, Dr. Soares, Dr. Ambrose, Dr. Watts, Dr. Houlton, Dr. Blair, Dr. Allen, Dr. Pryce, Dr. Jamini Sen, Dr. Murphy, Dr. Harry, Dr. Mackellar, Dr. Umpherstone, Dr. Maclaren, Dr. Lamb, Dr. Rukhmabai, Dr. O'Hara, Dr. Friend Periera, Dr. Macmillan, Dr. Lockwood, Dr. Dodson, Dr. O'Brien, Dr. Scott, Dr. Grant, Dr. Graham, Dr. Bahadurji, Dr. Gray	37	11	1
Glasgow Eastern Medical Society (per Dr. S. Wallace Anderson) ...	5	0	0
Lieut.-Col. W. E. Scott Moncrieff	1	0	0
North Ayrshire Pharmacists' Association (per Messrs. Rankin and Borland)...	1	1	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Ltd.

THE APPEAL FOR SURGICAL INSTRUMENTS.

Surgical instruments should be sent to the Master of the Society of Apothecaries of London, Blackfriars, London, E.C.

DEATH OF DR. GEORGE AUGUSTUS JEFFERY.—The death occurred on Nov. 17th at Hailsham, Sussex, of Dr. G. A. Jeffery at the patriarchal age of 91. A native of Cornwall, he settled at Eastbourne some 60 years ago and played a considerable part in its successful development as a seaside resort. He relinquished his practice there a few years ago. His student years were passed at University College, London. He became M.R.C.S. in 1846 and L.S.A. in the following year, and twenty years later graduated M.D. (by examination) at St. Andrews. In 1850 he was appointed medical officer to the Eastbourne union and became later a member of the board of guardians, eventually being elected chairman. He took an active interest in all local affairs, was chairman of the local board, and one of the first members of the town council on the incorporation of the borough. Up to a few years ago he regularly presided at the Hailsham bench of county magistrates. With all this public work he was an able and careful physician, a refined, genial, and upright man, whose death leaves a notable blank. He had this year celebrated his golden wedding. He leaves a widow, a son, and three daughters.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 27, 1915.

Lord Knutsford's Special Hospitals for Officers.

NEURASTHENIA, like appendicitis, is a modern disease, unknown by name at least to the medical student of 30 years ago. Whether the disease itself has not existed, in some guise or another, since a much earlier period in the world's history may be a subject for academic discussion: there are some who maintain that it is essentially the product of modern civilisation, and that its widespread occurrence signifies merely that the times are ripe for its development. GEORGE M. BEARD was among those who assign the chief and primary cause of neurasthenia to the complex agencies of modern life, which he distinguished from the ancient by these five characteristics: "steam-power, the periodical press, the telegraph, the sciences, and the mental activity of women." According to him, civilisation is the one constant factor without which there can be little or no "nervousness," although we may find it somewhat arduous to elucidate the mechanism whereby the former brings about the latter. But if we assume that neurasthenia is the outcome of the strain and stress of a civilisation which differs from those of other epochs, then we may be inclined to wonder whether the protean manifestations of "nervousness"—using the term less in a popular than in a scientific sense—among officers and men otherwise unwounded but rendered incapable of service and invalided home may not be a reflex of the fact that this war differs from all preceding wars, in that agents and factors are at work that have not previously been seen or known. Wherein does this war differ from other campaigns of history? Surely in the duration of the battles, the size of the combatant armies, the prolongation of the hours of strain, responsibility, and wakefulness, the intensity of the artillery bombardments, and the unheard-of degree to which mechanical devices for scientific (and unscientific) slaughter have been elaborated. In addition to the novelties, certain features both of ancient and modern wars are to-day concentrated in one as never before—long-distance and hand-to-hand fighting, underground and overhead duels, siege-, trench-, and field-warfare—every variety of conflict has its place, every sort of horror from steel arrows to lacrymatory shells is utilised indiscriminately. The organism, not having had previous experience of such overwhelming stimuli, does not always adapt itself adequately to its environment, hence a long series of homecoming cases labelled more or less indefinitely as "nervous breakdown," "collapse," "shell shock," "shell concussion," "traumatic hysteria," "traumatic neurasthenia," where the symptoms are insomnia, battle dreams, disturbances of the special senses, "functional" palsies and anæsthesias, emotional over-reaction, defects of mental synthesis, mental instability or disequilibrium, even paramnesia and hallucinations. It matters little, perhaps, what is the exact ticket to attach to such cases; they occur just as much on the German side, as is shown in another column[1], where the same difficulty of nomenclature has also arisen; it suffices that they are the product of modern warfare under modern conditions, and that in the fulness of time they have made their appearance. We must be equally modern in the adaptation of our methods of healing.

Considerations such as these lead us to give special prominence to Lord KNUTSFORD'S appeal, an organised scheme for the treatment of officers suffering from such symptoms, details of the working of which were given in our issue of last week. It was initiated in a small way by the opening last January of a hospital of some 33 beds at Kensington Palace Green. So alert has the governing committee been, so responsive to the increasing needs of the times, that within a year two other branch hospitals for the treatment of cases differing somewhat from the type originally catered for have been organised, while yet another is in process of coming into being. Now that the scheme is practically in full working order, Lord KNUTSFORD'S special hospitals are able to deal with all sorts of organic and functional nervous disease, the result of psychical or physical traumata indifferently, occurring in officers who have been on active service. The honorary staffs of these hospitals consist of men whose names, we think it will be agreed, carry weight as those of specialists familiar with the nervous and mental diseases of civilian life and qualified to deal with the phenomena of war cases for that reason.

Lord KNUTSFORD'S initiative has resulted in the organisation of a thoroughly practical scheme whereby physical and psychical injuries to the nervous system in officers are roughly classified as they occur abroad and the cases transferred to the appropriate hospital with the least possible delay. The descriptions which we have given of the administration and equipment of these units, Nos. I., II., and III., will demonstrate to the reader how completely Lord KNUTSFORD'S appeal has served to fill a special place in the treatment of a large group of cases resulting from the warfare of to-day, and we are convinced that the view expressed in the article above referred to is correct—that the records of cases studied in these special hospitals will have great scientific value and importance. In comparison with the total number of casualties among officers, no doubt only a relatively small proportion are considered suitable cases and find their way to Lord KNUTSFORD'S hospitals, but it is gratifying to know that the organisation for this

[1] See under Neurology in article on Current German Medicine, p. 1195.

particular group can scarcely be improved on, while we are assured that the results already being secured are favourable and encouraging. Lord KNUTSFORD has by his lead in this important scheme made a material contribution to the adequate success of the whole medical and surgical treatment of the injuries of war, of which the scale is so far-reaching that the resources of the medical profession as a whole must also be organised as they have never been before.

The Poor-law Medical Officers' Memorandum.

THE Poor-law Medical Officers' Association has forwarded to the Departmental Committee, appointed by the Local Government Board to consider and revise the existing Poor-law Orders, a Memorandum on the various orders affecting district and workhouse medical officers, with recommendations as to revisions and additions. The document referred to is couched in terms of marked moderation, and the justice of the claims made by the Poor-law medical officers for official reconsideration of the terms of their service in the light of the conditions in which it is rendered at the present day should commend itself to the committee and to all cognisant of the facts governing the situation. The question is entirely one of bringing up to date a system which ministers to the necessities of the sick in the poorest class of our population, and which is based upon orders made long enough ago to be inapplicable in detail to modern circumstances. In order to appreciate the situation at a glance it is enough to realise that the tenure of office by Poor-law medical officers is regulated by the Medical Appointments Order of May, 1857, and that many matters relating to the performance of their duties with regard to which more dissatisfaction has arisen, are governed by articles in the Consolidated Order of July, 1847. All questions as to these topics, while directly concerning medical officers holding appointments, should also be regarded by the public as affecting the general efficiency of the service which as ratepayers they maintain, and for which they should be anxious to secure the competition of thoroughly well-equipped medical practitioners. To the public, therefore, as well as to boards of guardians, some of the facts shown in the Memorandum should be of interest. Perhaps the most striking of these, and the most readily grasped by all, is to be found in paragraph 5 of the Memorandum. It is there pointed out that extra fees are allowed to be paid when certain operations are performed, and that some of these, as well as others, have to be performed as matters of urgency if they are to be of any use. The prescribed fees, however, are only granted in the case of district and not of workhouse medical officers, and the list of operations for which they are permitted is that drawn up in 1847, and consequently is limited to operations practicable at that date. It is, as the Memorandum expresses it, "unthinkable" that the operations for which extra fees are permitted would not have been more numerous if the present developments of modern surgery had been available in 1847.

Altogether it will be found that in about sixteen instances the Poor-law medical officer has reason to feel that conditions offered to his predecessor half a century ago are ill adapted to the needs of 1915, and that these deficiencies inflict injustice upon himself and in many instances, directly or indirectly, on his patients. The necessity for residence by the medical officer within the geographical limits of the district reminds us that telephones, motor vehicles, and increased railway traffic afford facilities for attendance upon patients with promptitude unknown to those who imposed a restriction the principle of which—the securing of prompt attendance—is all which now need be considered. This has already been recognised by an Order affecting metropolitan medical officers made in 1880. The need for security of tenure, justly asked for by whole-time officers, who have no private practice to fall back upon, has been commented upon in these columns over and over again. Remuneration should be calculated upon the basis of modern congestion of population and consequently upon the more arduous conditions of practice. The proposition is contradicted by nobody, and yet reform has not occurred. Another important matter, arising again out of modern developments, relates to the giving of certificates when required by the guardians, the relieving officer, or the patient. We need not enlarge upon the multiplication of certificates brought about by more or less recent legislation, or upon the injustice of adding unpaid, but by no means unimportant, clerical work, to the responsible medical work for which the medical officer is engaged. Not a few of the complaints raised have to do with duties, also not existing in earlier days, which can be performed only by medical men: these are attempted to be imposed upon Poor-law medical officers as a matter of convenience and because economy can thus be effected at the officers' expense. Included in these are the attendance upon cases which are afterwards found not to be proper subjects for poor relief, and in which the guardians retain fees recovered by them; attendance on boarded-out children; attendance when summoned by the police to cases of sudden illness found in the streets; attendance on paupers in isolation hospitals, including patients from Poor-law districts outside that in which the hospital is situated; medical treatment of school children; and the performance of work now usually relegated to specialists, whereas Poor-law medical officers are essentially general practitioners engaged to do the work of such.

Other subjects dealt with in the Memorandum are the necessity, in the interest of the patients no less than that of the medical officer, of giving to the latter the undisputed control of the sick

wards of non-separate medical infirmaries; the desirability—again, a matter of importance to the patient—of freeing medical officers from the obligation to supply drugs; and the provision of a definite scheme for a periodic increase in the salaries of all Poor-law medical officers according to length of service. The Memorandum, as will have been seen from the brief summary of the points given above, raises no financial questions of sufficient magnitude to delay the introduction of the reforms which it suggests, and the changes asked for are not such as to render legislation necessary to enforce them. These considerations, as well as the difficulty now felt in securing suitable men for the appointments in question, should serve to commend it to the sympathetic consideration of the Departmental Committee. The fact that at one time revolutionary changes in Poor-law administration seemed imminent has no doubt been responsible for the survival of obsolete conditions, the amendment of which is possible, independently of the general reorganisation which for the present has been postponed.

Annotations.

"Ne quid nimis."

INTESTINAL PROTOZOA OF MAN.

In our present issue we publish an article by Dr. C. M. Wenyon on the Common Intestinal Protozoa of Man, and some notes on their diagnosis and pathogenicity. The contribution is a very instructive one and deals in a masterly manner with those protozoal organisms which inhabit the digestive tract of human beings, especially in warm climates. It is of special interest at the present time when large numbers of soldiers are being brought to this country from Gallipoli, convalescent from or actually suffering from various forms of gastro-intestinal affections, especially dysentery. As is well known, this affection has always been accountable for a large amount of sickness in armies engaged in warfare. Fortunately, in France and Belgium the health of our troops has been most satisfactory, but in Gallipoli the majority of the men engaged have suffered from some variety of "diarrhœa." No actual statistics have yet been published, but judging from the statements of medical officers who have been invalided, dysentery has prevailed to an enormous extent. At first it was considered to be of the bacillary form, but since laboratory examinations have been made the amœbic variety has been shown to be very common. Dr. Wenyon gives an excellent account of this organism, and explains the difficulties which may arise in its identification. During the acute stage the amœbæ can be easily recognised, but when the symptoms have abated the large forms are becoming replaced by smaller ones. These often resemble the harmless entamœba coli so closely that a diagnosis may be impossible, in Dr. Wenyon's experience, if only the vegetative stages are depended on. The cysts, which are more easily differentiated, are responsible for the spread of infection, and carriers may maintain their infections for long periods, which adds to the dangers of the campaign. Further, the cysts may be spread by any agent which will distribute them, such as flies, water, wind, and possibly also dust. All these elements probably played a part at Gallipoli, but as during the summer the number of flies was prodigious, this was considered to be the chief factor in the dissemination of the disease. With the lessening in number of the flies it is hoped that the incidence of dysentery will become less. It is a further interesting fact that the use of emetine in the treatment of the disease was, on the whole, satisfactory, but actual statistics must be awaited before any definite conclusions can be arrived at. Dr. Wenyon's remarks on the intestinal flagellates of man are also worthy of study, and much practical information is given in regard to the best methods of examination of the stools for the various organisms.

PARATYPHOID.

From the discussion at the Royal Society of Medicine on Nov. 9th and 23rd paratyphoid emerges as an ill-defined clinical entity susceptible to bacteriological diagnosis by not very difficult means. In France, where so far it has been most accurately studied, some 1200 cases have occurred up to date, with a case-mortality of 1·5 per cent., or approximately one death per regiment. It is transmitted by carriers, probably among the civil population, and careful work amongst the poor Belgian refugees has practically eliminated the disease from the Ypres district. Possibly the foreign troops may also have had to do with bringing it, as India and Ceylon are centres for the infection. The clinical diagnosis from typhoid is not always possible, but in general paratyphoid is a milder and shorter disease, and a sudden onset with shivering, abdominal pain and aching limbs, without abdominal distension, and with an eruption, when it appears, of large and palpable spots, speaks strongly for paratyphoid. Bradycardia, too, is very characteristic, especially so in the extreme form, with a pulse-rate below 50 at a time when the temperature has just fallen to normal. As the appearance of the eruption may be delayed, it may coincide in time with the bradycardia. In cases of some duration, paratyphoid has to be distinguished from chronic dysentery, and here bacteriological tests may be necessary. The Widal-Gruber serum reaction is conclusive in its results and serves to divide enteric fever up into its three component parts of typhoid, paratyphoid A and B, as well as to separate off a group of mild febrile cases resembling dengue, but not actually dengue, for which a name is still lacking, although by common consent it is the disease which should *not* be called trench-fever. How paratyphoid is conveyed from patient to patient is still a matter of conjecture, but suspicion rests for the moment more strongly on the mosquito than on the louse. Finally, the credit of the first description of the disease in 1896 lies with Achard of Paris.

THE MIDWIFERY REPORT OF THE MANCHESTER MEDICAL OFFICER OF HEALTH.

Dr. James Niven, the medical officer of health of Manchester, has issued a report on the local midwifery for last year. The publication in some respects follows the lines of the reports issued by the larger lying-in hospitals, and in addition to containing a good deal of information of value to those interested in the subject, is of importance as

indicating the close touch which a medical officer of health and his assistants now have with the important national question of the welfare of the mother and child. The statistics are supplied in concise tabular form by Dr. Marguerite Douglas, and deal with no less than 9409 births; among these there were 58 cases of puerperal fever. During the year in all 105 cases of puerperal fever were notified, this total including 20 cases where infection followed abortion, and also cases where the patients had been attended by medical men. These 105 cases are analysed in great detail according to the day of onset of the fever, and the particular district in which they occurred. Twenty-three of these patients died; of these five were after abortions. One table shows again the unfortunate fact that fatal cases of puerperal sepsis are not diminishing. From 1905 to 1914 the number of deaths from this cause in Manchester has been respectively 25, 30, 20, 24, 17, 31, 26, 21, 21, and 23. These figures may well be a subject for thought. Another interesting paragraph shows that under Rule 19 of the Central Midwives Board there were 2606 medical records received, and that out of 757 applications from medical practitioners for fees 654 received £568 14*s*. The still-births are analysed and a serious attempt made to assign a cause, thus aiding pre-maternity work.

THE HEALING ART IN ANCIENT EGYPT: A NEW PAPYRUS.

THE history of ancient medicine has had the misfortune to lose what probably would have proved one of the most interesting records of the commencement of the healing art in ancient Egypt. The work was contained in a papyrus, whose script is of the second century A.D., of which a considerable piece has been preserved and has just been published by the Egypt Exploration Fund, although unfortunately the larger part has perished. Originally the manuscript related the history of the first celebrated practitioner of Egypt, whose fame was such that he was subsequently deified—Imouthes, or Imhotep,[1] who without any adequate reason was by the Greeks identified with Asclepius. The deification of a person, other than a Pharaoh, was very unusual, but it was carried out by alleging that Imhotep was son of the god Ptah, but his mother, wife, and other relatives ordinary mortals. He was a combination of sage, physician, and sometimes architect, who seems to have lived in the early era of the third dynasty, as has previously been more fully explained in our columns. The new-found papyrus is a curious document of some importance for the early story of medicine and its connexion with alleged marvellous cures during incubation in the Asclepeia. The author of the text states that the purpose of his work was chiefly to give a paraphrase of an ancient papyrus concerning Imouthes, whom he subsequently calls Asclepius son of Hephaestus This old papyrus, itself a copy, was found in a temple of Imhotep at Memphis in the time of King Nectanebo, an incident previously told us in Egyptian records. The new story now carries back Imhotep worship to the remote time of Mycerinus, builder of the third pyramid at Gizeh. There can be little doubt that the document used by the writer of the new-found Greek text was one of a kind very common in Egypt—a story concocted for the purpose of proving that certain priests possessed the hereditary right to various temple functions. The composer of it worked up the story of Imhotep from the record found in a temple with the object of showing that he was the proper person to hold the office of priest of Imhotep, with power to bequeath that position to his posterity.

The value of the mutilated manuscript, now first edited, lies in the light it throws upon Imhotep-Asclepius worship at the commencement of our era. The writer says that he had resolved to honour Asclepius by translating into Greek the old Egyptian work he had before him, but he feared he might do it imperfectly and so fail to make the recital a proper panegyric of the deity. He intended waiting until old age approached, when increased knowledge and experience would better equip him for the task. Three years elapsed, and his mother was then seized with a quartan ague. Her friends came seeking remedy at the temple, and the god showed himself favourable in dreams, cured the lady by "simple remedies," for which mother and son rendered due thanks by sacrifices. Subsequently the author became ill himself. The malady came on with pain in the right side, a violent fever burned him, and he was convulsed with loss of breath and coughing, which proceeded from the pain in the side. He hastened, accompanied by his mother, to the shrine and lapsed half unconscious into sleep. The mother, wide awake, suddenly perceived a vision. A being of superhuman stature, clothed in shining raiment and carrying a book, regarded the patient intently from head to foot and then vanished. When she had recovered from the surprise of the vision the mother woke up the invalid, to find that the fever had departed, leaving a profuse perspiration. When the invalid spoke it was to recount, as a dream, all that his mother had witnessed whilst awake. The pains "in the side" soon ceased, the god having given him "an assuaging cure." The couple then set about expressing their gratitude by the customary sacrifices and, it may be presumed, donations. Asclepius, however, notified that such were not the recompenses and evidence of gratitude he required. He wished the fulfilment of the promise made years ago to re-edit in Greek the ancient Egyptian book. Our author therefore says that since the divine Master regretted the non-composition of the divine book invoking his providence and filled with the story of his divinity and inventiveness he set about the dutiful task in the following manner:—

> Throughout I have filled up defects and deleted superfluities. Hence, Master, I conjecture the book has been completed in accord with thy favour, suiting thy divinity. As the discoverer of this art, Asclepius, greatest of gods, thou hast the thanks of all men. For every sacrificial gift or votive offering presently perishes, but a written record is an undying meed of gratitude renewing its youth in the memory. Every Grecian tongue will tell thy story and every Greek worship Imouthes. Assemble all, who by serving the god have been cured of diseases, ye who practise the healing art, ye who have been blessed by great abundance of benefits! For every place has been penetrated by the saving power of the god.

The text then for a few lines proceeds to recount the history of "Asclepius son of Hephaestus and the manner in which Asclepius (Imhotep) told Mycerinus to busy himself with his tomb." These last words of the papyrus evidently are leading up to an account of Imhotep's warning to the Pharaoh, by means of his medical skill, of approaching death.

[1] Spelled variously. I-em-hotep (Dr. Richard Caton, THE LANCET, June 26th, 1904), Imhōtp and Imhotep (Encycl. Britt.).

SULPHATE OF COPPER IN THE TREATMENT OF CANCER.

A COMMUNICATION from Dr. L. Manara, of the Casalmaggiore Hospital, was published recently in *Il Policlinico*, in which he claims to have effected a complete cure in a case of uterine cancer by sulphate of copper. The case is related in full and illustrated by seven photogravures of the microscopical appearances of portions of the cervix removed at different times for examination from preparations made by Dr. R. Lambri, of the Institute of Normal Anatomy in the University of Parma. The case is thus removed from the category of so-called "reported cures," and consists of as many details as possible which in the absence of the patient are available for criticism of the value of the therapeutic measures adopted by the author. The patient, aged 49, suffered from metrorrhagia and offensive purulent discharge and was found to have a cauliflower excrescence of the cervix uteri, and on August 17th, 1914, daily intramuscular injections into the gluteal region of a 1 per cent. ammoniated solution of sulphate of copper were commenced. The exact formula is not given, but the effect is thus described. On the fifth day the bleeding entirely ceased, the patient felt better, and appetite and colour returned. Early in September the cervix uteri was observed to be larger than before, but the cancerous granulations were rosy instead of turgid, less prominent, and secreted a large quantity of whitish creamy pus, inodorous, rich in mucus, and free from any trace of blood. This pus, examined without staining under the microscope, showed a dark network of metallic lustre of a red mahogany colour, which the author declares to be suboxide of copper precipitated by the glycogen of the cancerous cells, which he calls "cuproglycogen." When the cover-glass smear of this pus was mounted in balsam, the network was broken up and the cuproglycogen collected into larger or smaller rings or into a mass. Even in fresh smears of pus stained with hæmatoxylin and eosin and mounted in xylol the cuproglycogen was readily distinguishable by its characteristic colour and refraction outlining the cancer cells, forming small rings and bundles in their protoplasm and nuclei. If the smears were treated with an aqueous solution of sulphuric acid and examined the cuproglycogen was found to be transformed into oval masses of various size and needle-shaped crystals of the characteristic colour of verdigris. After the injections had been continued every other day until Sept. 20th the cervix uteri was seen to be still large, the os presented the appearance of an ordinary erosion with inodorous pus, the cervical canal which was previously occluded by vegetations was pervious, and the mucous membrane growing over the os. A fragment removed for examination showed a mass of fibrous tissue with remains of cancer cells in process of attack by the copper. By Oct. 10th the body and neck of the uterus had diminished in size, the os had become smooth, and by Jan. 10th the uterus seemed to be cured and a fragment removed with hardly any bleeding showed that the os was now covered with pavement epithelium, under which were the remains of glandular tubules of the cervical mucosa of normal appearance scattered in a thick layer of cicatricial fibrous connective tissue. Weekly injections were then given until the end of April, when the patient was discharged in good health, the cervix had completely cicatrised and the uterus was of normal size and mobility. The author's summary is that the sulphate of copper introduced into the organism is reduced and precipitated in the form of suboxide by the glycogen of the neoplastic cells. These lose their vitality because by the caustic action of the suboxide their protoplasm and nuclei swell up and dissolve into an amorphous mass. Thus the development of the neoplasm is arrested and transformed into a benign afebrile inflammatory process which resolves by suppuration if open externally or is reabsorbed by phagocytosis if closed, and repair ultimately ensues by cicatrisation.

FOOT-AND-MOUTH DISEASE IN MAN.

WE have recently referred to the prevalence of foot-and-mouth disease in England in 1914.[1] All attempts to cultivate the microbe have failed; it belongs to the class of ultra-microscopic or filter-passing viruses. Being highly contagious, the disease is readily communicated from animal to animal. Occasionally it is communicated to man, usually by the milk of infected cows, sometimes by inoculation. As cases do not often come under medical observation the following typical case is of interest. It is recorded in the *Johns Hopkins Hospital Bulletin* for October by Dr. P. W. Clough. In the article referred to the symptoms present in animals are given. This case completes the description of the disease by a picture of it in man. The patient was a medical student, aged 20 years. He had been in regular attendance at the Johns Hopkins School since Oct. 1st, 1914, and had been in the country only on one day, Dec. 24th, when he went to Washington, D.C. He had not been in contact with any animals and had drunk no milk, but had eaten butter and used cream with coffee. No case of a similar nature was known in his boarding house or in the neighbourhood. His illness began on Dec. 25th with burning and soreness of the feet. On the following morning he noticed a dry taste in the mouth, "like alum." This rapidly increased to a painful burning sensation, and the throat became very sore. The toes became more painful, tender, red, swollen, and numb. He was admitted to hospital on the night of the 26th. On examination he was a robust man with a temperature of 99·8° F. and a pulse of 100. The glands at the angle of the jaws were palpable. The spleen was not felt, but became palpable on the tenth day. The tongue was moist and coated. The mucous membrane of the mouth was rather dry and red. The pharynx and tonsils were deeply injected, as were the posterior portion of the soft palate and the cheeks, especially along the lines of closure of the teeth, where there were several small slightly elevated areas of exudate, 1 to 3 mm. in diameter. The posterior pharyngeal wall and tonsils were covered with a thin layer of greyish muco-purulent exudate, readily removed with a swab. The toes and feet were swollen, deep red, and tender as far back as the metatarso-phalangeal joints. Smears from the throat showed no fusiform bacilli or spirilla, and cultures for diphtheria were negative. On Dec. 27th the stomatitis had much extended. The inner surfaces of the cheeks and lips, the ventral surface and margins of the tongue, and the grooves between the tongue and gums and between the gums and teeth were involved. The mucous membrane was intensely red, raw, and very sore. There were numerous small slightly elevated, yellowish areas 2 to 5 mm. in diameter which in places coalesced

[1] THE LANCET, Oct. 30th, 1915, p. 984.

to form areas 1 to 2 cm. in diameter. There was marked salivation. By the fourth day the process had extended to practically all the visible mucous membrane of the mouth, and there were minute vesicles or pustules on the tongue. The lips were very red and cracked and showed several large flat pustules. On Dec. 28th an eruption of papules 3 to 5 mm. in diameter appeared on the palms and backs of the hands surrounded by erythema. Later some of these developed into vesicles or pustules. Vesicles and minute petechiæ also formed on the soles. After the seventh day the eruption subsided and was followed by desquamation. By the tenth day the stomatitis began to diminish. The patient was discharged on the thirty-third day with reddish blotches on the hands and some desquamation of the palms. The treatment consisted of mouth washes of potassium chlorate and permanganate, and skin lotions to relieve the itching. The clinical picture corresponded to that of foot-and-mouth disease and to that alone. At the time the disease was present in cattle in the neighbourhood of Baltimore, and infection by means of milk or cream was possible.

COMBINED VACCINATIONS.

A PAPER on Combined Vaccinations by Dr. Aldo Castellani, formerly of Colombo, but now professor of tropical medicine in the University of Naples, who has been recently working in the Serbian military hospitals, was read at the November meeting of the Society of Tropical Medicine and Hygiene. The following is a short summary of the conclusions of the paper. Professor Castellani thinks he is justified in saying that the preparation of combined vaccines is based on the experimental work which he carried out in 1901–02 in Professor Kruse's Institute, when he demonstrated that in animals inoculated with two or three species of bacteria—provided a sufficient minimum quantity was given—agglutinins and immune bodies for all the germs were elaborated, the amount of agglutinins and immune bodies elaborated for each germ being nearly the same as in control animals respectively inoculated with only one species. He has prepared and used the following vaccines:—

1. Typhoid plus paratyphoid A and paratyphoid B.
2. Typhoid plus paratyphoid A, paratyphoid B, and cholera.
3. Typhoid plus Malta fever.
4. Typhoid plus paratyphoid A, paratyphoid B, and Malta fever.
5. Typhoid plus paratyphoid A, paratyphoid B, cholera, and Malta fever.
6. Typhoid plus paratyphoid A, paratyphoid B, B. asiaticus, and B. columbensis.
7. Typhoid plus paratyphoid A, paratyphoid B, B. asiaticus, B. columbensis, and Malta fever.
8. Typhoid plus paratyphoid A, paratyphoid B, dysentery Kruse-Shiga, dysentery Flexner, dysentery Hys Y, dysentery Flexner-like No. 1, and dysentery Flexner-like No. 2.
9. Cholera plus plague.
10. Cholera plus plague, typhoid, paratyphoid A, and paratyphoid B.
11. Cholera plus plague, typhoid, paratyphoid A, paratyphoid B, and Malta fever.

The inoculation of the above vaccines in man is harmless; the reaction is not severe, with the exception of those containing plague, but even simple plague mono-vaccines give generally a severe reaction. The combined vaccines Professor Castellani is now using consist of carbolised emulsions of agar cultures in normal salt solution without heating. These emulsions seem to give a less painful reaction than broth cultures killed by heat. The presence of 0·5 per cent. carbolic acid is sufficient to kill the germs. The individuals inoculated with those of the above-mentioned vaccines which contain two or three or four species of bacteria generally produce agglutinins for each species of bacteria. The amount for each species is not much less than that observed in control individuals inoculated with simple "one disease" vaccines. Of the vaccines containing more than four species, some, as for instance the plague plus cholera, typhoid, paratyphoid A, and paratyphoid B vaccine, seem to give good results; others are not so satisfactory, protective substances developing only for two or three or four species and suddenly disappearing. The combined vaccines which Professor Castellani has found most useful from a practical point of view are the typhoid plus paratyphoid A and paratyphoid B vaccine, and the tetravaccine typhoid plus paratyphoid A, paratyphoid B, and cholera. The latter vaccine has been prepared in Serbia on a large scale by himself, with the assistance of Dr. Mendelson and Dr. Borvic; it was officially adopted by the American Red Cross Sanitary Commission and by the Serbian Government, and more than 170,000 men were inoculated with good result. Finally, it may be stated that these combined vaccines, when efficient, are of practical advantage, saving a great deal of time and rendering possible a contemporaneous vaccination for several different maladies.

THE LONDON SCHOOL OF MEDICINE FOR WOMEN.

IN 1874, when Dr. Sophia Jex-Blake founded the London School of Medicine, there were only two women—Miss Elizabeth Blackwell and Mrs. Garrett Anderson—on the British Medical Register. The school has been the principal agent in rectifying this, as it has trained more than 600 of the thousand or more registered medical women. Starting with 14 students in a small private house in Hunter-street, larger premises were built on the original site in 1900, in the expectation of an average annual entry of 35 students. This number was, however, soon exceeded, and during the years 1908–1914 rose to 60, with the result that the council found itself obliged, in June, 1914, to decide on additions to the chemical, physiological, anatomical, and pathological departments. A piece of land adjoining the present premises was accordingly secured, but on the outbreak of war the project was temporarily abandoned. A critical situation then arose, as on the one hand applications for admission continued to increase, and on the other the threatened shortage of men students rendered the education of medical women a matter of double importance to the nation. In December, therefore, of last year an appeal was issued for £30,000 to provide adequate accommodation for the enlarged number of students; of this sum £20,000 has come in, and the building of the extension has been begun. Point has been added to the urgency by the record entry this winter session of 112 students. Now there remains about £10,000 necessary to complete the scheme. We have no doubt that this sum will be promptly forthcoming. As Mrs. Willey pointed out two months ago, the prospective shortage of medical practitioners in the immediate uture is very disquieting, and it is a grave national oncern in which everyone will share to minimise

the risks which this situation will involve. There is no profession which opens out better prospects than medicine to young women with the necessary ability and physique who feel the call and are prepared to devote five years or more to its study.

"CURES" FOR DIABETES.

MEMBERS of the medical profession rightly look with suspicion upon announcements in the lay press of the discovery of a specific remedy for some well-known disease, and as a rule their caution is justified; but the wide publicity given to such announcements is often the cause of much unnecessary anxiety on the part of the public, for it gives rise to hopes that are rarely fulfilled in the minds of sufferers from the malady for which the "cure" is claimed and their friends. The statement that "a positive cure" for diabetes has been discovered which has recently been made (*Daily Mail*, Oct. 11th) appears to be a case in point. Careful search of the *American Journal of Medical Science*, in which the new treatment was said to be described, has failed to reveal any article crediting "bicarbonate of soda and a small amount of salt" with the marvellous powers ascribed to them, and we can only conclude that the paragraph in question was inspired by the misinterpretation of information gleaned by some non-medical reporter from two recent papers respectively by Dr. F. M. Allen and Dr. E. P. Joslin in the *American Journal of Medical Science* for October, dealing with the method of treating diabetes by prolonged fasting advocated by the former, in which it is stated that sodium bicarbonate may be dispensed with if patients suffering from glycosuria are treated on the lines they describe. These papers are of sufficient importance and interest to merit notice. Control of glycosuria by fasting is not a new thing, but hitherto the loss of weight which results has been held to contraindicate its prolonged use. As a result of his observations on diabetic dogs Dr. Allen has come to the conclusion that it is not a valid objection, and he maintains that freedom from sugar can be secured in all cases of uncomplicated diabetes by fasting before there is danger of death from starvation, even though it may be necessary to continue the fast for eight or ten days. He believes that if glycosuria and hyperglycæmia are prevented by complete abstinence from food, the rest thus given to the damaged structures, notably the pancreas, allows of a marked recovery of function with a resulting increase in carbohydrate tolerance, so that starchy foods can be subsequently given without harm up to a point depending upon the extent of the structural changes. After the initial fast has rendered the urine sugar-free the patient is for a day or two given only vegetables containing a low percentage of starch. If no sugar appears in the urine, vegetables with a higher proportion of carbohydrate are allowed, and later fruit, potato, oatmeal, and bread are cautiously added to the diet. If the urine still remains sugar-free, protein foods are given in gradually increasing quantities until the patient is consuming from one to one and a half grammes per kilogramme of body weight. Finally, the fats are increased until the patient ceases to lose weight, but no attempt is made to increase it. A reappearance of sugar in the urine at any stage is met by a fast for 24 hours, or until the sugar disappears, when the previous diet is resumed, except that the carbohydrate is reduced to half. Although the results obtained with this method of treatment are said to be highly satisfactory as regards both the glycosuria and acidosis, which is claimed to be controlled more satisfactorily than by any other means, we are inclined to think that the discomfort which it entails will seriously militate against its general use, even if further experience substantiates its merit. We may point out that it appears to be assumed that all cases of glycosuria are of the same origin and will respond equally well to one form of treatment. This is contrary to the experience of most modern clinicians, however, and it is not unlikely that, like the "oatmeal cure," the "potato cure," and other special forms of treatment for diabetes of which great things were at first expected, Dr. Allen's method will ultimately prove of use, but only in a limited field. In another part of this issue we publish a paper by Dr. P. J. Cammidge which approaches the dietetic treatment of diabetes from a different side. Instead of making the patient fit the diet, as it were, he shows how it is possible by systematic and complete analyses of the urine when the patient is taking food of known composition to work out a diet exactly suited to the metabolic defects of the case. Dr. Cammidge points out that defective utilisation of carbohydrates is not always the most important feature of glycosuria or diabetes, and that faults in the metabolism of proteins and fats may be the cause of more serious symptoms. He therefore advises that greater attention should be paid to evidence of such defects, and describes in detail how the "nitrogen balance" for determining the way in which proteins are being utilised can be worked out. According to his observations it is impossible for a case of diabetes to improve until nitrogenous equilibrium is established, and if his experience is confirmed it would seem that a most important step has been made in both the treatment and prognosis of the condition. It is noteworthy that Dr. Allen and Dr. Cammidge have this in common: both insist on the limitation of the protein as well as the carbohydrate intake in diabetes, but while the former determines the allowance of protein by a more or less empirical method, the latter is guided by a comparison of the quantitative results of analyses of the urine with the known composition of his test diets from day to day.

AMONG the awards made recently by the President and Council of the Royal Society with the King's approval is a Royal medal to Dr. W. H. R. Rivers, F.R.S., for his important contributions to ethnography and ethnology. The names of the Council proposed for 1916 which will be of special interest to the medical profession are those of Professor J. G. Adami, Sir T. Clifford Allbutt, Professor Arthur Dendy, Dr. H. Head, and Professor E. H. Starling.

STRIKE AT A SANATORIUM.—As the result of a difference of opinion with the medical officer, 16 patients discharged themselves recently from the South Staffordshire Joint Tuberculosis Sanatorium at Moxley. They applied for permission to go outside for a walk, but as extensive grounds are provided the medical officer refused the request. Notwithstanding this the men went out, and on their return three, who were regarded as the ringleaders, were instructed to leave the institution, but the others were given an opportunity of apologising. Instead of taking advantage of this they left the institution. Later three of them were readmitted on expressing regret. The House Committee supported the action of the medical officer, and reported five patients to their Insurance Committees.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Edinburgh School for Children with Skin Disease.

A REPORT by H.M. Inspector on the Lauriston Special School at Edinburgh states that in the year 1914 an increase in the accommodation was felt to be urgently necessary. The managers therefore acquired an adjacent house, and the enlarged school was opened at the beginning of the present session. Five new class-rooms, spacious, bright, and well equipped, were now available, and the total accommodation had been raised from 60 to 160 places. During the past year 67 pupils received clearance medical certificates and left the school to resume attendance at their ordinary schools. Since the opening of the enlarged school 84 new pupils had been admitted, and there was still a fairly long list awaiting admission. Arrangements for medical supervision and treatment of the pupils were of a very thorough character, and efficiently carried out by nurses who are constantly on the premises. The arrangements for instruction earned the inspector's highest praise. Classification was very careful, and the small classes—20 pupils in each—permitted of a great deal of individual attention. In spite of the rather long interval between exclusion from the ordinary day school and admission to this special school the leeway was in most cases soon made up. The pupils in all the classes were eager and responsive, and perceptibly anxious to make progress. The teachers were devoted and highly capable, bringing skilled intelligence to the task of surmounting the special difficulties of the situation.

Opening of Outdoor Dispensary at Glasgow Lock Hospital.

The directors have now opened a dispensary at the Glasgow Lock Hospital for the treatment of outdoor patients suffering from the various forms of venereal disease. Structural alterations of the buildings have been completed, providing waiting-room accommodation and a fully equipped treatment room. The corporation of Glasgow have kindly granted a right of way to the dispensary through adjoining property belonging to the city, so that patients may enter without having to pass through the hospital. The lock hospital is the second oldest medical institution in Glasgow, having been founded by Seal of Cause from the magistrates and town council in 1805, ten years after the opening of the Royal Infirmary.

Aberdeen's High Death-rate.

For the quarter ending September last, Aberdeen, in comparison with the other principal towns in Scotland, had the highest death-rate from all causes, its position being largely due to the high death-rate from infectious diseases. Exclusive of the latter, the death-rate of Aberdeen stood below that of Greenock, Dundee, and Glasgow. For the same quarter Aberdeen had a death-rate of 135 per 1000 births among infants under one year, this being the highest figure among the seven largest cities in Scotland. The question was raised at a meeting of the Aberdeen town council held on Oct. 1st, when the convener of the public health committee submitted that the matter was receiving the attention of the medical authorities, and nothing was being left undone that could be done to lessen the rate.

Precautions against Small-pox.

The public health committee of the Aberdeen town council received a circular letter from the Local Government Board suggesting precautionary steps in view of the occurrence recently of cases of small-pox in the north-east of Scotland and the Shetlands. Their medical officer of health, Dr. Matthew Hay, thereupon directed the attention of medical practitioners to the desirability of advising the vaccination of all unvaccinated infants and the revaccination of grown-up persons, especially such as were employed in the fishing industry or in connexion with the docks. Vaccination was offered gratuitously at the Public Health Office, the City Hospital, and the Dispensary. The proportion of children remaining unvaccinated has been gradually increasing, and is becoming a growing menace to the health of the community in the event of the occurrence of an outbreak of small-pox.

The Late Professor Buchanan.

Dr. Alexander MacGregor Buchanan, whose death has occurred at the age of 71 years, was professor of anatomy at Anderson's College Medical School, Glasgow, and occupied for many years a prominent position in the medical profession in Scotland. He was born at Leith and educated at the University of Glasgow, taking an M.A. degree and graduating M.D. later. He then became in succession resident surgeon and resident physician to the Royal Infirmary. He devoted himself exclusively to anatomical studies, demonstrating in the subject from 1868–1873, when he was appointed to the vacant chair of Anatomy. Dr. Buchanan was a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow, an examiner in anatomy and dental anatomy of the faculty, and examiner in anatomy at the University of Glasgow (1890–96). He contributed many articles to the *Journal of Anatomy and Physiology*, and his largest work was an illustrated Manual of Systematic and Practical Anatomy, including Embryology (two vols., 1906). He had a profound knowledge of his subject and possessed in a rare degree the faculty of enlisting and maintaining the interest of his students.

Nov. 22nd.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Certification of Insured Persons in Ireland.

IT will be remembered that last August the Irish Insurance Commissioners obtained the assent of the Irish medical profession and the Approved Societies operating in Ireland to a scheme for the certification of insured persons requiring sickness benefit. The essentials of the scheme were that the medical attendant of the insured person should certify and should be paid for his work by the Commissioners, but that the Approved Societies should have the right to appeal to a referee, a number of whom were to be appointed and paid by the Commissioners. The Insurance Commissioners have now announced that, on account of the war and the demand for medical men by the War Office, they are compelled to postpone until the end of the war the part of their scheme dealing with the appointment of referees. The Commissioners were informed that the possibility of a number of salaried posts being created in connexion with the Insurance Act in Ireland was the cause of some reluctance on the part of certain practitioners to

offer their services to the War Office. They have therefore stated to the profession that no such posts will now be created, but that when they are created after the war military service will entitle candidates to favourable consideration. The position taken by the Commissioners is, from the public point of view, a proper one to adopt, but there is some danger that the societies may withdraw their assent from a scheme which is no longer fortified by a system of referees.

Lieutenant Walter T. McCurry, R.A.M.C.

At St. Mary Magdalene Parish Church, Belfast, on Nov. 20th, the Right Rev. Dr. D'Arcy, Bishop of Down, unveiled a tablet, erected in the church by the members of the congregation, to the memory of Lieutenant Walter T. McCurry, who was killed in action at Ypres on March 15th last.

Royal Victoria Hospital, Belfast.

Professor T. Sinclair, F.R.C.S. Eng., senior surgeon of the Royal Victoria Hospital, Belfast, has been appointed consulting surgeon to the troops in France, with the rank of Colonel; while Dr. J. S. Morrow, physician in charge of the out-patients at the same institution, has received a commission as Captain in the Royal Army Medical Corps. These appointments, added to those of the other members of the medical staff of the Royal Victoria Hospital, bring the number up to almost one-third of the medical staff who are serving their country at the front.

Death of Mr. Thomas Duncan, L.R.C.P. & S. Edin., J.P.

Mr. Thomas Duncan, who for a period of over 40 years was medical officer, and medical officer of health, of Fintona dispensary district of Omagh Union, died on Nov. 17th, at his residence in Fintona, co. Tyrone. A native of the Castlederg district, Mr. Duncan studied at Queen's College, Galway, and in 1872 he became L.R.C.P. & S. of Edinburgh, after which he began practice in Fintona, where he was dispensary doctor, medical officer of health, and attendant on the Royal Irish Constabulary. Of a kindly disposition, and with a sound knowledge of his profession, he was greatly respected in his district, and especially by the poor, to whom he was attentive and helpful. He had been in failing health for some time, and a month ago he was obliged to resign his official appointments. For a considerable number of years he acted as secretary of the Tyrone Medical Association. Two of his sons at present are holding commissions in the Royal Army Medical Corps.

Nov. 22nd.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Cupping in the Early Diagnosis of Eruptive Fevers.

IN order to make a precise and rapid diagnosis in suspicious or doubtful cases, M. d'Oelsnitza recommends resort to cupping an appropriate area of skin, preferably that on which the eruption tends to appear early. In so doing he has observed a regional and topographic accentuation of the eruptive elements. The persistence of the accentuated picture revealed by cupping may also serve in establishing a retrospective diagnosis when the normal eruption is already effaced. Further, since cupping in certain cases gave rise to ecchymoses, it might serve to give warning of a hæmorrhagic tendency in the fever and have some prognostic value.

Extraction of Bullets from the Bladder by the Natural Passages.

Rifle and machine-gun bullets have a calibre and form permitting of their rapid removal by the urethra without operation. For this purpose M. Legueu uses a specially modified lithotrite, which is introduced into the bladder through the urethra, and seizes the bullet under tactile control. In less than a minute the extraction is complete without anæsthesia. One man was able to leave the hospital next day, and another who had been unable to walk for eight months was able to resume his duties rapidly. The difficulty is to make sure that the bullet is really in the bladder. When the radiogram shows a bullet in the pelvis two successive plates should be taken, one before and one after a change of position. If the bullet then alters its position with the position of the body, it must be lying freely in the bladder.

Employment of Powdered Permanganate in the Treatment of Wounds.

M. Belin has for more than ten months employed permanganate of potash in powder form in the treatment of all wounds coming before him in the veterinary service of an infantry brigade. He has accumulated a vast experience, starting with laboratory research before the war, and is struck with the surprising rapidity with which wounds treated in this way cicatrise. In 15 days even severe wounds may cicatrise without extraction of the bullet. M. Belin has studied the mechanism of action: a true living culture of organic cells results, the permanganate rapidly ceasing to be a powerful antiseptic and becoming a cicatrising agent which constantly gives up oxygen to the subjacent plasma and so to the cells bathed by it, oxidising the toxins and protecting the damaged area by means of the continuous adherent crust which the application has produced. The same technique applied to the treatment of human wounds has given precisely similar results: the pain produced is bearable, not exceeding that caused by the application of iodine. In view of the simplicity of the method, the atoxicity of the product, its value as an antiseptic, the duration of its action, the adherence to the wound which is protected even if the dressing slips, its favourable action of cicatrisation, and its bactericidal and inhibitory action especially on anaerobes (tetanus, gas-gangrene), M. Belin considers that it would be rational to add a packet of permanganate to the first-aid outfit, as this will result in saving life and avoiding complications.

The Hot Iron and the Body Louse.

One of the great calamities of the trenches is the constant struggle with minute but unbearable parasites originating largely from the trenches newly taken from the enemy. Apart from stoving there is scarcely any rapid method of ridding the clothing of lice. An excellent and very simple method is as follows. An iron is heated to a moderate temperature, and first the underclothing and then the outside clothes are systematically treated. In the case of the former, both adult lice and nits are exterminated by a single ironing. For cloth further precaution is needful; for nits, which are always laid on the hairs of the exposed surface of cloth, one ironing is sufficient; but for the adult parasites, which take refuge in the seams, it is necessary to pass the iron back and forth several times at a high temperature over the principal seams, especially of the back and collar.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

The Health of Calcutta.

THE health of the city during the year 1914 was on the whole satisfactory, as may be gathered from the report just issued. The death-rate was 28·3 per 1000, against 29·2 in 1913, and in the canal area, which was formerly very unhealthy, the mortality was as low as 20·7 per 1000. On the other hand, the birth-rate was only 19·4 per 1000, as compared with 20·5 in 1913 and 21·6 in 1912. There was also a further rise in the rate of infant mortality, which now stands at the very high figure of 282·7 per 1000 births registered.

The Viceroy's Legislative Council: A Bill to Protect Scientific Medical Practitioners.

The Bill which Surgeon-General Sir Pardey Lukis, Director of the Indian Medical Service, introduced into the Viceroy's Legislative Council on Sept. 22nd to prevent the granting to unqualified persons of titles implying qualification in Western medical science, is one that has been needed for some time past. The following is a review of the circumstances in which Imperial legislation is being introduced:—

Six years ago the Bengal Government submitted proposals for the passing of an Imperial Medical Registration Act, applicable to all India, and including provisions to put an end to granting, by unauthorised persons or bodies, of degrees or licences to practise under the Western system. There were, and still are, four institutions in Calcutta turning out men with diplomas and licences which were more or less colourable imitations of those granted by recognised English and Indian examining bodies, and no arrangements existed for outside control or inspection. These self-constituted medical colleges, with one possible exception, did not provide a proper course of instruction or facilities for teaching, and in some of them arrangements for clinical instruction were practically non-existent. The Bengal Government therefore held that, on the analogy of the Legal Practitioners Act, both fully qualified practitioners and the public were equally entitled to be protected in respect of the practice of the Western system of medicine. The Government of India in 1910 expressed the opinion that while a Provincial Medical Registration Act, on the lines of that in the Bombay Presidency, might be introduced, it was undesirable at that stage to undertake legislation affecting the colleges in question at Calcutta. The course was taken of seeing whether they could not be induced to unite in forming one really good teaching institution, which might either be affiliated to the university, or, if it failed to reach the university standard, to the Campbell Medical School. So much in earnest were the Government to secure amalgamation that they agreed to certain recurring and non-recurring grants, which should enable one of the colleges at any rate to be placed on a sound footing; no amalgamation has taken place; and the position is now practically just what it was in 1908.

The above statement should make it clear that only in the last resort is action being taken. There are Medical Registration Acts in force already in several of the larger provinces, others are under consideration, and an Imperial Act has become a necessity. Its provisions were briefly explained by Sir Pardey Lukis, and it is important to note that he added:—

The Bill does not affect the right of any person to exercise the profession of medicine or to practise as a physician or surgeon, provided that he does not pretend to qualifications which he does not possess, and its operation is rigidly restricted to the Western methods of allopathic medicine and surgery; practitioners of the homœopathic, Ayurvedic, and Unani systems being excluded from the purview of the Bill.

The Government have no desire to injure any of the self-constituted colleges of Calcutta, but they do wish to induce them to bring their teaching staff up to a proper standard of efficiency, to provide proper appliances and clinical material for the training of their students, and instead of examining their own students and issuing their own diplomas to submit to regular inspections on the part of some recognised examining body, to which they have secured affiliation, such as the Calcutta University or the State Medical Faculty of Bengal. The Bill will in ordinary course be circulated to local administrations and public bodies. Full opportunity will hereafter be given for its discussion in Council, and it is hoped that its merits will in the end be generally recognised.

The Drug Habit on the Frontier.

The consumption of *charas*, a drug which is of the most pernicious kind, is on the increase in the North-West Frontier Province, in spite of the duty having been raised from Rs.10 to Rs.12 per seer in 1913. According to the last Provincial Excise Administration Report, consumption during the last two years had been considerably in excess of the average before the advance was made, and it now becomes a question whether a further rise in the rate would not be advisable. The policy of progressive increase in duty has been steadily carried out, but still *charas* retains its popularity. The difficulty in the province is that if a higher rate is fixed an impetus may be given to smuggling from across the border. Cocaine and opium smuggling has also to be dealt with, but the Excise staff seem to be on the alert, and if the courts will cease to show undue leniency when convictions are obtained the illicit trade may be reduced to small proportions.

Oct. 31st.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ANNUAL MEETING OF FELLOWS AND MEMBERS.

THE thirty-first annual meeting of the Fellows and Members was held at the College on Nov. 18th. In the absence of Sir William Watson Cheyne, the President, at the commencement of the proceedings, Sir FREDERIC EVE, the Senior Vice-President, took the chair, and laid the annual report of the Council before the meeting. In dealing with this report he remarked on the scarcity of subjects for dissection, and mentioned the fruitless actions which the Council had taken to remedy the position. At the present, however, the need had become momentarily less acute, as the number of students was now much less owing to the war. The next matter with which he dealt was the question whether medical men must always give information to the police when they become aware that an abortion has been criminally performed. He referred to the charge of Mr. Justice Avory, and drew attention to the answer of the Council in which it stated that in a matter of honour and conscience no written rules could have any binding effect, for they could never be enforced. The Vice-President then proceeded to describe the special regulations which the Council had made in order to facilitate the obtaining of a qualification by those who had completed their training. He also drew attention to the absence of members of Council and officials and servants of the College in connexion with the war. As to the diplomas granted by the College, the war had led to some interesting differences; thus the College had granted 525 diplomas of Membership, this being an increase of 117 over last year, and the difference was to be attributed mainly to the fact that an extra examination had been held, while the number of diplomas of Fellowship had fallen from 71 to 21. It had been found necessary to remove a large number of specimens

from the shelves of the museum as they contained large quantities of spirit, and store them in the strong vaulted basements. It was also stated that copies of the report had been sent to 941 Fellows and to 2574 Members.

In the discussion which followed, Mr. M. I. FINUCANE criticised the financial portion of the report, and expressed the opinion that the Council had not made any attempt to economise, had not converted the Consols it held, and had not invested in the War Loan.

At this point the PRESIDENT, who had now taken the chair, explained that the report dealt only with the affairs of the College up to midsummer, and that was the reason why there was no reference to these financial matters, but he explained that the College had converted its Consols and had invested in the War Loan.

Mr. GEORGE BROWN maintained that there was no shortage of medical men in spite of all that had been said, and he opposed the replacement of medical men by medical women.

The PRESIDENT then called upon Dr. GEORGE JONES to move the first resolution. It was as follows:—

That this thirty-first annual meeting of the Fellows and Members again affirms the desirability of admitting Members to direct Representation on the Council of the College, which, as now constituted, only represents those Members who also hold the Fellowship, and that it does so in order that the constitution of the Council of the Royal College of Surgeons of England shall be in keeping with modern ideas of true representation.

He mentioned that he brought forward this motion in no spirit of hostility to the Council, but in the real interest of the College. He referred to the history of the College, and showed how in 1843 the Fellowship had been constituted. He urged that the Council would be acting in the best interests of the College in granting the franchise to the Members; there were many matters which came before the Council which could not be adequately dealt with by anyone not in general practice.

The motion was seconded by Mr. FINUCANE, who expressed his disapproval of the very temperate manner in which Dr. Jones had introduced the motion. He maintained that the report of the Council was enough to show that it was utterly unfitted to deal with the matters that came before it. Their methods were unbusiness-like in the extreme. He told the Council that they would be compelled before long to adopt a more modern constitution.

Mr. BROWN and Captain J. G. FITZGERALD supported the resolution, which, when put to the vote, was carried *nemine contradicente*.

Mr. J. BRINDLEY-JAMES then moved the second resolution:—

That this annual meeting of Fellows and Members of the Royal College of Surgeons of England requests the President to explain to those now assembled the views of his Council in regard to the representation of Members on the Council of the College.

He complained that year after year a resolution was carried at the annual meeting affirming the need for the extension of the franchise to the Members, and year after year the stereotyped reply was given that the Council saw no advantage in the proposed change.

The motion was seconded by Mr. G. ANGUS HUNT.

After a little discussion the PRESIDENT replied. He said that he could not express the opinion of the Council for he did not know what it was, and he was afraid that if he said anything it might be taken for his opinion as President. However, speaking merely as an individual member of the Council, he expressed a doubt whether the proposed change would really be advantageous. The objects of the College were the direction of the education of the medical student, the examination of candidates, and the advancement of surgery, while the Members appeared to want to convert the College into something very like a trades-union.

After a vote of thanks to the President the meeting terminated.

URGENCY CASES HOSPITAL.—In THE LANCET of Nov. 6th, p. 1055, the excellent work of this hospital received notice, and the *Times* of Nov. 20th contains a further urgent appeal for financial support to provide for necessary extensions and pay for immediate expenses. The head of the Medical Service of the 3rd French Army, in recording his appreciation of the work, states: "My efforts to give you accommodation worthy of the advantages afforded by your assistance are evidence of the value which I attach to your help." We hope the necessary support will be forthcoming.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

Staff-Surgeon George Murray Levick has been specially promoted to the rank of Fleet-Surgeon in His Majesty's Fleet for services with the British Antarctic Expedition, 1910 (dated Nov. 21st).

The undermentioned has been entered as a Surgeon for temporary service in His Majesty's Fleet:—Maitland Bodley Scott (dated Nov. 17th).

ARMY MEDICAL SERVICE.

The undermentioned temporary appointment is made:—Director-General: Surgeon-General (ranking as Lieutenant-General) Sir Alfred Keogh, K.C.B., retired pay (dated Oct. 3rd, 1914).

Temporary Colonel Frederick F. Burghard relinquishes his commission (dated Oct. 25th).

Special Appointment (Graded for Purposes of Pay as Staff Lieutenant, 1st Class).

E. Kingscote, late Surgeon-Captain, Royal Wiltshire (Prince of Wales's Own Royal Regiment) Yeomanry, Territorial Force, and to be temporary Captain (dated Sept. 17th).

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel Charles Edward Ligertwood, late 5th Mounted Rifles, Imperial Light Horse, to be temporary Major (dated Nov. 5th).

Temporary Captain Alfred H. Carter to be temporary Major (dated Nov. 20th, 1915).

Captain Cluny Macpherson, 1st Newfoundland Regiment (Medical Officer), to be temporary Major (dated August 9th).

Captain James Wells Rose, C.A.M.C., from Canadian Artillery, to be temporary Captain (dated Oct. 2nd).

The undermentioned to be temporary Majors whilst employed with the Huddersfield War Hospital:—
Dated Oct. 4th: Peter MacGregor and John George Rowell.

The undermentioned to be temporary Captains:—
Dated Oct. 18th: William Henry Payne.
Dated Oct. 20th: Francis Peake Maitland.
Dated Oct. 21st: Robert Cecil Turle Evans, late Captain, 1st London Royal Engineers (Volunteers).
Dated Oct. 22nd: Aubrey Dean Vernon-Taylor.
Dated Oct. 27th: George Gunnis Ferguson, late Surgeon-Captain, London Scottish Rifle Volunteers.
Dated Oct. 28th: Surgeon-Captain Charles Noble le Brocq, Medical Corps, The Royal Militia of the Island of Jersey.
Dated Nov. 1st: Temporary Lieutenant George E. Vilvandré.

The undermentioned temporary Lieutenants to be temporary Captains:—
Dated Sept. 15th: John J. A. Sherry.
Dated Sept. 19th: James R. Gyllencreutz and Edward Hamilton.
Dated Sept. 21st: Lewis H. F. Thatcher, Isaac B. D'Olier, and Leslie H. Skene.
Dated Oct. 2nd: Wallace McC. Conley.
Dated Oct. 5th: Daniel McVicker and John S. Stewart.
Dated Oct. 10th: Guy A. C. Mitchell, Victor D. O. Logan, and Charles M. Forster.
Dated Oct. 19th: Cecil H. Treadgold.
Dated Oct. 21st: James G. Higgins and Albert J. McC. C. Morrison.
Dated Oct. 24th: Arthur S. Blackwell.
Dated Oct. 25th: Robert W. Michell and Charles McM. Wilson.
Dated Oct. 28th: Louis Cassidy.
Dated Oct. 29th: David W. Woodruff.
Leslie Haden Guest to be temporary Captain (dated Nov. 1st).

The undermentioned Lieutenants of the Canadian Army Medical Corps to be temporary Lieutenants:—
Dated Oct. 27th: George William Racey, Leonard Hugh Douglass, Thomas Alexander Brandon, Charles R. Totton, David Caw Wilson, and James Davis Curtis.

The undermentioned temporary Honorary Lieutenants to be temporary Lieutenants:—
Dated Oct. 18th: Joseph Russell Tibbles.
Dated Oct. 19th: Charles Sherbourne Dodson.
Dated Oct. 23rd: Septimus Alexander Forbes and Harry Arnold Ash.
Dated Oct. 24th: Eric Arnold Scott.
Dated Oct. 26th: Andrew Royston Elliott.
Dated Oct. 27th: Reginald Hugh Simpson and Charles Cyril Okell.
Dated Oct. 30th: Gerald Straun Marshall.
The undermentioned to be temporary Lieutenants:—
Dated Sept. 27th: Francis Christopher Plummer.
Dated Oct. 12th: Lieutenant Gordon Blanchard Wiswell, C.A.M.C.

Dated Oct. 14th: Alexander Gold Waddell.

Dated Oct. 15th: Lieutenant Hamnett Townley Douglas, C.A.M.C.

Dated Oct. 18th: Seymour Cochrane Shanks, Graham Morris, Edwin Charles Girling, Thomas William Sweetnam, John Davey Evans, John James McMillan, George Francis Hegarty, Frederick Morres, Frank Shirley Adams, Andrew Neilson, Richard Denton Attwood, Robert Lewis Thornley, Frederick Whitaker, Alexander Wilson Frew, Frank Hodson Bromhead, Edwin Boyers, Herbert Arthur Luke Banham, and Alan William Holthuson.

Dated Oct. 19th: William Noel Hazerigg Bell, William Hornsby, and David Sims.

Dated Oct. 20th: John Gordon Sharp, George Clark Stewart, Maurice Davies, Arthur Norman Haig, John Stevenson Mitchell, William Halliday Welsh, Alexander Gibson Henderson, David Gair McRae, and Halford Thomas Wilkins.

Dated Oct. 21st: James Bradley-Hughes, Walter Mercer, Eugene Aaron Bernard, Ralph Campbell Lindsay Batchelor, Frederick John Cleminson, and Brven McDermott.

Dated Oct. 22nd: William Christopher MacFetridge, Charles Hunter Graham, and John James MacRitchie.

Dated Oct. 23rd: Alfred Bealy Blomfield, James Broomhead, Edward Maynard Ashcroft, Eric Bellingham Smith, William Benjamin Walker, Thomas Mulcahy, Thomas Fletcher Lumb, Edward James Primrose, Stephen Francis Smith, Frank Vause, Robert Moir Lechmere Anderson, Thomas Dick McLaren, and Arthur Herbert Spicer.

Dated Oct. 24th: Harry Spong.

Dated Oct. 25th: Michael McNiff, Francis Seward Beachcroft, Campbell Kay Stevenson, Sydney John Darke, Vincent Middleton Coates, Charles Alexander Robertson Gatley, Robert Bain Lothian, George Stewart Murray, Kenneth Norman MacLean, Frank William Martyn, Alexander Charles Edward Gray, James McDonald, Reginald Peter Nutcombe Brickland Bluett, Frederick Buick McCarter, Sidney Trevor Davies, Ernest Osmond Gilkes, Charles Digby Halcomb, Alexander Bruce Simpson, Andrew Paton Gray, Alexander Fitzgerald Grattan Guinness, George Reid, Thomas William Newton Dunn, Bertram Marriott Bennett, Alfred William Popert, Harry Angell Lane, James Raffan, William MacDermott, and Wilfred Guy Stuart Neely.

Dated Oct. 26th: James Grant Morrin, William James Olivey, Rainald Heaton, and Roderick MacGill.

Dated Oct. 27th: Sidney Langford Hinde, Richard Burges, Herbert Newsome, Dyfrig Huws Pennant, and Reginald Robert Elworthy.

Dated Oct. 28th: Richard Fenton Theodore Newbery, Alexander Mills Kennedy, William Allan Higgins, George Turnbull Walker, Joseph Patrick McGreehin, Donald John MacDougall, John Hughes Murray, Robert Kinnear Hay Gillespie, Alexander Dick, Hugh Laurence McCormick, Norman William Gilchrist, Charles Reginald Edwards, John Rigby, Edward Henry Wheeler, and Kenneth McAlpin Ross.

Dated Oct. 29th: John Kerr Muir.

Dated Oct. 30th: Eric Llewellyn Ivens and John McMillan.

The undermentioned to be temporary Lieutenants:—

Dated June 6th: William Bunting Wamsley.

Dated July 5th: Donald Meek.

Dated Nov. 1st: Alexander Dick, Alfred Joseph Dunlop, John Wesley Bennett, Charles Witts, Charles George Lambie, Alan Richmond Snowdon, Evan Clarence Ellis Van-Eyck, Ion Keith-Falconer MacLeod, Hugh Campbell Highet, Robert George Allen, Arthur Denys Rope, William Percival Ker, Bernard Watson Jones, Thomas Harold Gibbs, James Fenwick Robertson, Thomas Fryer O'Kell, John Noonan Meade, David Peter Gaussen, John Webster Bride, Ernest William Shaw Hughes, William Square Edmond, Bryan Joseph Nolan, Daniel Viliesid, Eldon Munro Litchfield, William Moir Shepherd, Philip Melancthon Ragg, Harvie Anderson Forrester, David Mann, Arthur Forbes Elliott, Alfred Edmund Francis Fonnereau Huntsman, Frederick John Ayre, George Henry Vane Appleby, Thomas George Wakeling, Douglas Reginald Pike, Alexander Burns, Herbert William Black Ruxton, Edwin Augustus Hutton-Attenborough, David Macnish, Frank Edgar Marshall, James McAlpine Scott, David Anderson, Robert Godwin Chase, Thomas Joseph Taunton, Charles William Ensor, Hugh Robinson Irvine, James Logan, and Ernest Lawton Matthew.

Philip Hudson to be temporary Honorary Lieutenant (dated Nov. 3rd).

Temporary Captain Robert Lloyd Roe relinquishes his commission on account of ill-health (dated Nov. 15th).

Temporary Lieutenant Harold C. Bloxsome relinquishes his commission (dated Nov. 10th).

Temporary Lieutenant Joseph Brewer relinquishes his commission on account of ill-health (dated Nov. 14th).

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

The undermentioned Lieutenants (on probation) are confirmed in their rank: William Hunt and Cecil McL. West.

TERRITORIAL FORCE.

Royal Army Medical Corps.

Highland Mounted Brigade Field Ambulance: Lieutenant David D. Mackay to be Captain.

London Mounted Brigade Field Ambulance: Frederick Porter Smith to be Lieutenant.

Lowland Field Ambulance: Lieutenants to be Captains: George J. Linklater and Alexander G. Buchanan.

South Midland Field Ambulance: Captain Reginald D. Moore, from Attached to Units other than Medical Units, to be Captain.

Northumbrian Field Ambulance: Lieutenant Henry Stonehouse to be Captain.

Southern General Hospital: Edwin Morton (late Surgeon-Lieutenant, 3rd Volunteer Battalion, The South Staffordshire Regiment) and John Gardiner to be Captains, whose services will be available on mobilisation.

London Sanitary Company: Lieutenant Owen H. Peters to be Captain. Herbert John Leslie Barefoot and Bernard Robinson Hebblethwaite to be Lieutenants.

East Anglian Field Ambulance: Captain Archibald B. Pettigrew is seconded for duty with the East Anglian Divisional Ammunition Column. To be Lieutenants: William John Dearden and Eric John Staddon.

Highland Field Ambulance: Lieutenants to be Captains: Henry Begg and John Moir.

London (City of London) Field Ambulance: Lieutenant William T. Homan to be Captain.

West Riding Field Ambulance: Clement Hoyle Heppenstall to be Lieutenant.

Wessex Field Ambulance: John Booth Kelly to be Lieutenant.

Western General Hospital: Captain Robert E. Kelly is seconded.

London (City of London) Sanitary Company: Lieutenant Gilbert N. Anderson to be Captain. Lieutenant John H. Baldwin to be Captain, with seniority next below Captain Arthur T. Pitts. Robert John Stewart McDowall to be Lieutenant.

Wessex Divisional Sanitary Section: William Harry Biggs to be Lieutenant.

Home Counties Casualty Clearing Station: Wilfred Lawrence Hibbert and Arthur Griffith Williams to be Lieutenants.

Eastern General Hospital: Lieutenant-Colonel Edward F. Maynard is seconded.

London General Hospital: The undermentioned to be Captains, whose services will be available on mobilisation: Harold Low, Charles Richard Box, John Shields Fairbairn, James Montagu Wyatt, John Herbert Fisher, Alfred Ernest Russell. William Joseph Teil Kimber to be Lieutenant.

Home Counties Field Ambulance: Lieutenant Francis S. Jackson to be Captain.

Attached to Units other than Medical Units.—Major Paul McK. Terry, from Wessex Casualty Clearing Station, and Arthur Butler-Harris (late Major, The Essex Regiment), to be Majors. Lieutenants to be Captains: Thomas A. Fisher, Thomas S. Allan, Walter Mundy Cox, Philip H. G. Gosse, and William H. Calvert. Henry Guy Ludolf (late Lieutenant, West Riding Divisional Train, Army Service Corps) to be Lieutenant.

FOREIGN ORDERS.

The King has granted to the undermentioned officers of H.M.S. *Jupiter* authority to wear the following decorations conferred upon them by the Emperor of Russia in recognition of valuable services rendered: To Surgeon W. I. Gerrard, R.N.V.R., and Temporary Surgeon W. G. Biggar, R.N., the Order of St. Anne of the Third Class, and to Fleet-Surgeon H. R. Gardner, R.N., the Order of St. Stanislas of the Second Class.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

The current issue of the *Journal of the Royal Army Medical Corps*, dated September, contains a further instalment of the report on the Results of the Bilharzia Mission in Egypt, 1915, by Temporary Lieutenant-Colonel R. T. Leiper; an account of the steps taken to eradicate beri-beri in Lebong during 1914 by Major J. C. Kennedy; a report on a series of relapses in an epidemic of enteric fever, by Lieutenant C. Clarke; and a discussion on the Surgical Treatment of Wounds on a Bacteriological Basis, by Captain J. O. Hamilton. Captain J. F. Gaskell, R.A.M.C. (T.F.), contributes a report from the Cerebro-spinal Fever Laboratory, which was opened on March 4th at Cambridge. The report is dated July, under the heading of Mode of Spread of the Disease the author states that there appears to be some relation between unsettled weather and the incidence of the disease, and that by far the larger number of cases occurred when the men

were in their billets or huts. The possibility of infection while on leave must, however, be taken into consideration. With regard to three cases which occurred in men recently inoculated against typhoid fever, it is pointed out that as very large numbers of troops were being inoculated at the time of the main incidence of cerebro-spinal fever it is almost impossible to regard these cases as more than coincidences, though "it is just conceivable, however, that in these cases the malaise following inoculation may have been a contributory cause to the ease of infection."

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7354 births and 5519 deaths were registered during the week ended Saturday, Nov. 20th. The annual rate of mortality in these towns, which had increased from 13·3 to 15·4 per 1000 in the four preceding weeks, further rose in the week under notice to 15·9 per 1000 of their aggregate population, estimated at 18,136,180 persons at the middle of last year. During the first seven weeks of the current quarter the mean annual death-rate in these towns averaged 14·5, against a corresponding rate of 15·2 per 1000 in London. The annual death-rate last week ranged from 4·3 in Enfield, 6·6 in Gillingham, 7·5 in Eastbourne, 7·6 in Hornsey, and 9·2 in Ilford, to 20·5 in Wigan, 22·6 in Liverpool, 23·5 in Middlesbrough, 23·6 in Gloucester, and 24·1 in Dudley.

The 5519 deaths from all causes were 156 in excess of the number in the previous week, and included 345 which were referred to the principal epidemic diseases, against numbers declining from 973 to 401 in the seven preceding weeks. Of these 345 deaths, 120 resulted from infantile diarrhœal diseases, 67 from diphtheria, 65 from measles, 49 from whooping-cough, 31 from scarlet fever, and 13 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·0, or 0·2 per 1000 less than in the previous week. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had steadily declined from 808 to 175 in the seven preceding weeks, further fell to 120, and included 21 in London, 13 in Liverpool, 11 in Manchester, and 6 each in Birmingham and Sheffield. The deaths referred to diphtheria, which had been 73, 71, and 74 in the three preceding weeks, fell to 67, of which 19 were registered in London, 4 each in Portsmouth and St. Helens, and 3 each in Stoke-on-Trent and Manchester. The fatal cases of measles, which had been 37, 57, and 67 in the three preceding weeks, fell to 65 last week; the highest annual death-rates recorded from this cause were 1·1 in Leicester, 1·5 in West Bromwich, 1·7 in Hastings and in Lincoln, 1·9 in Blackburn, 2·1 in Stockport, 2·6 in Bury, and 4·1 in Gloucester. The deaths attributed to whooping-cough, which had increased from 31 to 51 in the four preceding weeks, fell to 49, and included 10 in London and 3 each in Norwich, Derby, Birkenhead, Liverpool, and Leeds. The deaths referred to scarlet fever, which had been 25, 23, and 20 in the three preceding weeks, rose to 31, and included 10 in London, 4 in Manchester, and 2 each in Ealing, Wigan, and Leeds. The fatal cases of enteric fever, which had been 25, 23, and 14 in the three preceding weeks, were 13 last week, of which 2 were registered in Portsmouth and 2 in Bradford.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 3110, 3066, and 3061 at the end of the three preceding weeks, further declined to 3027 on Saturday last; 336 new cases were admitted during the week, against 378, 344, and 339 in the three preceding weeks. These hospitals also contained on Saturday last 1590 cases of diphtheria, 58 of measles, 51 of enteric fever, and 8 of whooping-cough, but not one of small-pox. The 1407 deaths from all causes in London were 88 fewer than in the previous week, and corresponded to an annual death-rate of 16·2 per 1000. The deaths referred to diseases of the respiratory system, which had increased from 169 to 340 in the five preceding weeks, further rose to 347 in the week under notice, and were 144 in excess of the number registered in the corresponding week of last year.

Of the 5519 deaths from all causes in the 96 towns, 232 resulted from different forms of violence and 483 were the subject of coroners' inquests, while 1619 occurred in public institutions. The causes of 64, or 1·2 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Hull, Newcastle-on-Tyne, and in 62 other smaller towns. Of the 64 uncertified causes, 11 each were registered in Birmingham and Liverpool, 5 in Gateshead, and 3 each in London and Blackpool.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,345,500 persons at the middle of this year, 887 births and 790 deaths were registered during the week ended Saturday, Nov. 20th. The annual rate of mortality in these towns, which had been 16·2, 16·1, and 17·3 per 1000 in the three preceding weeks, rose to 17·6 per 1000 in the week under notice. During the first seven weeks of the current quarter the mean annual death-rate in these towns averaged 16·4, against a corresponding rate of 14·5 per 1000 in the large English towns. The annual death-rate last week ranged from 7·0 in Clydebank, 9·9 in Kilmarnock, and 12·3 in Leith, to 19·4 in Glasgow, 23·6 in Coatbridge, and 23·8 in Paisley.

The 790 deaths from all causes were 12 in excess of the number in the previous week, and included 61 which were referred to the principal epidemic diseases, against 61 and 89 in the two preceding weeks. Of these 61 deaths, 16 resulted from measles and from scarlet fever, 15 from diphtheria, 12 from infantile diarrhœal diseases, and 2 from whooping-cough, but not one from enteric fever or from small-pox. The mean annual death-rate from these diseases was equal to 1·4, against 1·0 per 1000 in the large English towns. The deaths attributed to measles, which had been 20, 15, and 26 in the three preceding weeks, fell to 16, and included 4 each in Glasgow and Edinburgh, and 2 each in Greenock and Hamilton. The deaths referred to scarlet fever, which had been 14, 12, and 14 in the three preceding weeks, rose to 16, of which 7 occurred in Glasgow, 3 in Edinburgh, and 2 each in Aberdeen and Paisley. The fatal cases of diphtheria, which had been 14, 9, and 13 in the three preceding weeks, rose to 15, of which 5 were registered in Glasgow and 4 each in Aberdeen and Paisley. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 25, 18, and 31 in the three preceding weeks, fell to 12 last week, and included 5 in Dundee and 4 in Glasgow. The 2 fatal cases of whooping-cough were recorded in Glasgow.

The deaths referred to diseases of the respiratory system, which had been 158, 150, and 166 in the three preceding weeks, rose to 177 in the week under notice, and were 65 above the number registered in the corresponding week of last year. The deaths from violence numbered 28, against 32 and 19 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 27 town districts of Ireland, with an aggregate population estimated at 1,212,380 persons at the middle of this year, 503 births and 478 deaths were registered during the week ended Saturday, Nov. 20th. The annual rate of mortality in these towns, which had been 16·9, 15·8, and 16·8 per 1000 in the three preceding weeks, rose to 20·6 per 1000 in the week under notice. During the first seven weeks of the current quarter the mean annual death-rate in these towns averaged 16·7, against corresponding rates of 14·5 and 16·4 per 1000 in the English and Scotch towns respectively. The annual death-rate last week was equal to 22·1 in Dublin (against 16·2 in London and 19·4 in Glasgow), 20·3 in Belfast, 20·4 in Cork, 16·5 in Londonderry, 13·5 in Limerick, and 22·8 in Waterford, while in the 21 smaller towns the mean death-rate was equal to 20·0 per 1000.

The 478 deaths from all causes were 87 in excess of the number in the previous week, and included 31 which were referred to the principal epidemic diseases, against 27 and 36 in the two preceding weeks. Of these 31 deaths, 9 resulted from infantile diarrhœal diseases, 8 from whooping-cough, 6 from measles, 3 each from scarlet fever and diphtheria, and 2 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases was equal to 1·3, against corresponding rates of 1·0 and 1·4 per 1000 in the English and Scotch towns respectively. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had declined from 36 to 14 in the four preceding weeks, further fell to 9, of which 4 occurred in Dublin and 3 in Belfast. The deaths attributed to whooping-cough, which had been 8, 2, and 4 in the three preceding weeks, rose to 8 last week, and included 3 in Ballymena, and 2 each in Belfast and Limerick. The fatal cases of measles, which had been 6, 2, and 3 in the three preceding weeks, rose to 6, of which 4 occurred in Dublin. The 3 deaths from scarlet fever were registered in Belfast, those from diphtheria in Dublin, Belfast, and Waterford; and those from enteric fever in Dublin and Ballymena.

The deaths referred to diseases of the respiratory system, which had been 53, 65, and 65 in the three preceding weeks, rose to 98 in the week under notice. Of the 478 deaths from all causes, 161, or 34 per cent., occurred in public institutions, and 9 resulted from violence. The causes of 12, or 2·5 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the large English towns the proportion of uncertified causes did not exceed 1·2 per cent.

Correspondence.

"Audi alteram partem."

THE USE OF ANTISEPTICS IN INFECTED WOUNDS.

To the Editor of THE LANCET.

SIR,—In your leading article in THE LANCET of Oct. 16th on the Treatment of Infected Wounds you state that as the result of Sir Almroth Wright's researches "nothing less than the use of the chemical disinfectant, with phenol as its prototype, is at issue." As one who worked in Edinburgh Royal Infirmary under Lord Lister in the days when he was elaborating his antiseptic system I am not quite prepared to accept the view that the use of antiseptics in infected wounds is to be decided by the results obtained with phenol as the antiseptic. Anyone conversant with the early history of antiseptic surgery is well aware that Lord Lister never recognised carbolic acid as the ideal antiseptic and was constantly on the look-out for other substances. One to which he had a special leaning, and of which he made constant use, was a solution of chloride of zinc, 40 grains to the ounce. Long before Lister's day it had won a reputation as Sir William Burnett's disinfecting and antiseptic fluid, one of the chief uses to which it was put being the preservation of anatomical subjects for dissection. Its abandonment for this purpose was due to the fact that owing to its corrosive action on steel such bodies were not found suitable for dissection, as they ruined the dissecting instruments. Other special incidents in the therapeutic use of chloride of zinc were its introduction by Canquoin in 1837 as a topical application in cancer, and its advocacy in 1866 by the late Mr. Campbell de Morgan, of the Middlesex Hospital, who applied it to the cut surfaces of a wound after an operation for removal of a cancerous growth with the object of destroying any cancer cells that might be present, and thus prevent a recurrence of the disease. The strength of Campbell de Morgan's solution was 40 grains to the ounce. Lord Lister was attracted to chloride of zinc as an antiseptic, not because of its germicidal power, but because of its affinity for albumen and gelatin, so that when placed in contact with living parts it exercised this affinity and, if used undiluted, formed an eschar or slough. The feature of the slough thus formed is that it is marked by the entire absence of odour. Such, however, is not the exact course of events when the substance is used in a solution of 40 grains to the ounce. When such a solution is applied to the surface of an ulcer or of any recent wound no apparent eschar is formed, and it seems to possess this remarkable property—that the effects of even one application of the solution last for some time, so that putrefaction is removed and the tissues are, as it were, pickled for three or four days. The putrefaction may not be eventually entirely removed, but it is absent at a time when the tissues are specially liable to absorption—that is, before granulations are formed. It is interesting to note what Lister wrote in THE LANCET of March 20th, 1875. It is as follows:—

> Chloride of zinc, I may remind the reader, has this peculiarity among all antiseptics that I have tried, that a single application of it to a recent wound, in a solution of the above strength (40 grains to the ounce), though it produces no visible slough, yet prevents the occurrence of putrefaction in the cut surfaces for days together, in spite of the access of septic material; and, *if the discharges have opportunity to flow freely away*, as after the removal of a tumour of one of the jaws, or a portion of the tongue, there may be absolutely no odour from first to last, the divided textures being thus guarded from the effects of putrefaction during the dangerous period before they have been covered by granulations.

The words I have italicised in the above quotation show the importance placed by Lister on early drainage of wounds.

What I have quoted above is now ancient and I fear by many forgotten teaching, but none the less it bears directly on the problem facing us in this war. That problem is, in my opinion, a double one, and involves two separate distinct issues. These are: (1) The immediate treatment of the wound when it first comes under the surgeon's care; and (2) the subsequent treatment, when the patient enters hospital with an infected wound. I have followed this controversy that is taking place with great interest, and I think that the two issues I have mentioned should be kept distinct. My own opinion is that everything points to the use of an antiseptic when a wound is first seen by the surgeon. Against this it may be urged that such a procedure would delay evacuation of the wounded. Then I reply that the details of the evacuation should be so modified as to allow of this necessary procedure being carried out. As to the antiseptic to be used, I consider a solution of chloride of zinc, 40 grains to the ounce, for application to the interior of the wound, has merits of its own that entitle it to a fair trial, care being taken always to have free drainage of the wound in conjunction with it. Were this procedure followed I believe wounds would reach the base hospitals in a more favourable condition than they do now. A letter such as this is not the place to argue for or against Sir Almroth Wright's physiological method of treating septic wounds. This may be quite right in the after-treatment, but it does not justify the abandonment of an antiseptic early in the management of a wound that has had septic matter introduced into it.

I follow Lord Lister's teaching in reference to the early treatment of such septic wounds—that is, that when first seen, unless many days have elapsed, an effort should be made to correct putrefaction in them. This being so, in view of the ragged and irregular nature of the wounds in this present campaign, probably the application of a solution of chloride of zinc would best meet the exigencies of the cases, accompanied always by free drainage.—I am, Sir, yours faithfully,

GEORGE THOS. BEATSON,
Consulting Surgeon, Glasgow Western Infirmary, and Surgeon, Glasgow Cancer Hospital.

Glasgow, Nov. 20th, 1915.

SO-CALLED "TRENCH FEVER."

To the Editor of THE LANCET.

SIR,—The evidence offered by Captain G. H. Hunt and Major A. C. Rankin that the cases of "trench fever" they describe in THE LANCET of Nov. 20th are instances of a new disease is open to several objections. So far from being a "clinical picture distinct from any other condition," the symptoms of onset very strongly resemble those of a large percentage of cases of the paratyphoid fevers. Almost the only differences are the lower proportion of cases of diarrhœa and of abdominal pain; otherwise the history is typical of the milder sorts of paratyphoid. The physical signs,

or absence of them, are quite compatible with the same hypothesis, notably the rarity of constitutional disturbance, of enlarged spleen, and of bronchitis, and, in fact, all the signs described. No information is given as to the frequency of epistaxis in the case-histories, nor of the state of the abdominal reflex; and though no rashes were observed it would be more satisfactory if one were assured that a careful daily watch for them had been practised well into convalescence. The temperature charts are absolutely typical of fairly mild cases of paratyphoid,[1] and the absence of pulse records is a serious blot on their elucidative value.

Great stress is laid by Captain Hunt and Major Rankin on the fact that all the 30 cases to which their paper refers suffered from one or more relapses. The value of this point as affecting the specific character of their new disease is entirely destroyed by their admission that they saw many otherwise similar cases in which no relapse took place. Incidentally, some of their charts suggest that the term relapse has been used in a spurious sense; a single normal reading during a decidedly intermittent fever does not necessarily justify the description of the second half of the pyrexia by that name. The proportion of cases with relapse to cases without it is not given, but if it was high may not the explanation (supposing the cases were paratyphoid) possibly be found in the statement that the patients were fed on ordinary diet, including meat? They say that "after the patient has been in hospital a few days the diagnosis is readily made." They base it upon four symptoms, only one of which (absence of rash) does not characterise the paratyphoid fevers. It is true that most cases of the latter do exhibit rashes provided they are very carefully watched well into convalescence; but a purely negative sign such as this is a poor thing upon which to found the diagnosis of a new disease.

The bacteriological evidence is equally slender. Blood cultures and cultivations of the fæces were negative; but the former are positive in a minority alone of paratyphoid cases, and the latter in not much more than half, even when repeated searches are made. If these cases are merely the surplus left after removal of those in which the bacteriological findings were positive, the negative results are valueless; even if they formed, as they do not, a consecutive unselected series, the evidence in favour of a "new disease" would be unconvincing. The Widal reaction is not mentioned from beginning to end of the paper; this omission alone vitiates all the conclusions put forward.

I am not concerned to show that these were cases of paratyphoid, though the facts available strongly suggest to me that diagnosis for at least some of them. There is, however, one additional hint to which I cannot refrain from alluding. The authors say that no isolation was practised and that no other patient caught the disease, but that a ward orderly did so. This, of course, is precisely what might be expected to happen if the cases belonged to the enteric group of fevers. I submit that Captain Hunt and Major Rankin are premature in their statement that "the temperature, the course of the disease, and the result of blood cultures show that it does not belong to the enteric group."

I am, Sir, yours faithfully,

HENRY ROBINSON.

Bramham-gardens, S.W., Nov. 21st, 1915.

[1] Cf. Heffernan and Clarke: Journal of the R.A.M.C., August, 1915. Torrens and Whittington: Brit. Med. Jour., Nov. 13th, 1915. Robinson: THE LANCET, Oct. 16th, 1915, p. 851.

TETANUS-LIKE SPASM LOCALISED TO THE WOUNDED LIMB.

To the Editor of THE LANCET.

SIR,—I was much interested to read Lieutenant-Colonel R. D. Rudolf's account in your issue of Nov. 13th of his three cases of spasm of the muscles of a wounded limb, as while working for the French Red Cross in France last spring I saw a very similar case, the history of which was briefly as follows:—

Private, aged 21, wounded by piece of shell in right gluteal region just below and in front of tubercle of iliac crest on March 23rd. He appeared to be doing well and was allowed up. On April 6th he complained of being tired as he had walked too much, and on the 7th was in great pain, spasmodic twitching of the muscles of the right leg, specially those of the back of the thigh, appeared, there was some tenderness along the course of the sciatic nerve, and in addition, there was tonic spasm of the whole leg, which was kept extended. The patient strongly resisted any attempt to flex hip or knee on account of pain, and any attempt at examination or movement increased the spasms. It was thought that the piece of shell might be pressing on the sciatic nerve. In spite of morphia, opium, bromides, and aspirin in large doses, the clonic spasms became more frequent and violent, and the patient was said not to have slept for four nights; he, however, looked well and had no rise of temperature or pulse. An X ray was taken, but it was necessary to administer chloroform owing to the movements. The piece of shell was shown close to the anterior inferior spine of the iliac crest and was removed on April 10th. Nowhere in its course had it passed close to any large nerve trunk. The spasms, both clonic and tonic, ceased when the patient was put under the anæsthetic, and the limb was tied up in a fully flexed position. As the anæsthetic wore off the clonic spasm showed some tendency to return, not the tonic, and it was explained to the patient that as the piece of shell was removed he would be all right. For a time he seemed to a large extent able to control the spasms, but after his leg had been released (24 hours later) the spasms, both clonic and tonic, returned worse than ever and became so violent as to shake the patient and practically prevent his obtaining any food. There was some tendency to chorea-like movements of the whole body, apparently started by the spasmodic contraction of the leg. It was noticed that he was always worse when under observation, and finally he was placed in a room by himself and his food left beside him. From that time on he gradually improved and was able to walk about three weeks after the operation, and was soon afterwards sent to his depôt.

This patient had received a prophylactic injection of antitetanic serum at the front; the absence of any contraction of the jaw, neck, or abdomen, and the normal temperature precluded the idea of tetanus; the very severe pain he suffered, sufficient to make him groan continually and cry out frequently, and making him sweat profusely, negatived the possibility of malingering, but not to our minds hysteria, of which we saw a large number of very curious cases among the French soldiers. This conclusion was supported by the cessation of all spasm, both tonic and clonic, under the anæsthetic, and its gradual return afterwards, though at first somewhat controlled by suggestion. Even large and repeated doses of bromides and injections of morphia in no way relieved the symptoms. Until the patient was prevented from taking a proper amount of nourishment by the severity of the spasms he looked well, and had not the appearance of a man who had not slept for several nights owing to severe pain. There is no doubt that from the time he was placed in a room by himself and left to take his food unwatched he gradually improved, though the process was slow. The description of Lieutenant-Colonel Rudolf's cases exactly tallies with this, even to the fact that any handling of the

limb immediately increased the clonic spasms, but this case seems to have been more severe and to have lasted longer.

I am, Sir, yours faithfully,

R. ATKINSON STONEY, F.R.C.S. Irel.,
Late Consulting and Operating Surgeon, 6th Section, 17th Region.

Dublin, Nov. 14th, 1915.

SULPHATE OF MAGNESIA IN NON-AMŒBIC DYSENTERY.

To the Editor of THE LANCET.

SIR,—During the 1898 expedition against the Waziris on the Indian North-West Frontier I published the very satisfactory results which I had had in South America in the treatment of non-amœbic dysentery, which had otherwise proved very refractory, by drachm doses of sulphate of magnesia every two hours, which proved out there in my experience—not a small one—to be a specific. Letters from the front and elsewhere, from the medical officer in charge of the jail at Mauritius, and, later, the experience of friends in the South African War, have confirmed my happy re-discovery—for a gentleman in Belfast wrote to tell me that the observation was not new (nothing, as he remarked, under the sun is), but at least 300 years old. Still, though old, it appears to have been forgotten, and I venture to mention it again in the hope that some of our younger surgeons at the Dardanelles—my experience in 1898 proved to me that the "law of inertia" is as true in medicine as elsewhere, and that the older generation are not only unreceptive but are actually hostile to a new idea—I say, I hope that some of our younger surgeons out there may give the treatment a fair trial. If their cases are non-amœbic I think they will be astonished at the results they will achieve.

I am, Sir, yours faithfully,

F. WYATT-SMITH, M.B., B.C. Cantab.
Poplar and Stepney Sick Asylum, London, E., Nov. 20th, 1915.

A COMBINED PHYSICAL TREATMENT FOR DISABLED SOLDIERS.

To the Editor of THE LANCET.

SIR,—During the last ten months a novel combination of physical methods of treatment has been in operation at the Hôpital Complémentaire at the Grand Palais in France. One of the new features is a hyperthermal *eau courante* bath, which is applied locally to the affected limbs, more especially *as a preparation* for massage and mechanical treatment. It is found that the *eau courante* bath greatly facilitates both massage and mobilisation. This combined treatment is now very extensively employed, both in Paris and in the country in hospitals set apart for it. According to the latest information, several hundred men disabled in their limbs were in October alone returned from the Grand Palais fit for military service, with an estimated saving to the French Government of upwards of £50,000 on account of pensions.

If in Paris, why not in London?

In England many similarly disabled men are to be seen in the hospitals, and sometimes in the streets. It is claimed that the treatment referred to holds out a fair prospect of recovery in many otherwise hopeless cases. It is recommended, therefore, alike by humanity and by considerations of prudent war economy.

A full account of the results obtained by the combined physical methods in military cases will shortly be published on behalf of a committee of the Royal Society of Medicine (Section of Balneology).—We are, Sir, yours faithfully,

R. FORTESCUE FOX,
J. CAMPBELL MCCLURE,
Honorary Secretaries to the Committee.

Devonshire-place, W., Nov. 22nd, 1915.

EVOLUTIONARY ETIOLOGICAL FACTORS IN DISEASE.

To the Editor of THE LANCET.

SIR,—In reference to your annotation on the above subject in THE LANCET of Nov. 20th, may I once more urge as an important amplification of your suggestion as to the necessity for "further research combining both clinical and bacteriological investigations on the obscure but fascinating etiological factors in disease" that *daily* swabbings from posterior nares or throats, or other clinical material, should be examined by direct microscopical methods as well as by cultivation in the laboratory.

The important point to remember is that the posterior nares or throat, or other site under observation in the human body, is Nature's laboratory where various symbioses and other important evolutionary factors exist which cannot be exactly copied artificially; further, ordinary laboratory cultivation methods may fail to reveal important organisms. I may cite as a case in point the bacteriology of Vincent's angina, which can only be appreciated by an *immediate* microscopical examination of the swabbing and not by laboratory cultivation. While all laboratory methods and requirements should, of course, be utilised in the requisite investigations, the daily direct method of examination should on no account be neglected; indeed, I venture to think it may prove the most fruitful for guidance.

I am, Sir, yours faithfully,

J. T. C. NASH.

Norwich, Nov. 22nd, 1915.

*** By those interested in the historical aspect of this subject reference should be made to Sir William J. Collins's address on the Chadwick School of Thought (Journal of the Royal Sanitary Institute, 1913, vol. xxxiv., No. 7), in which he recalls that as early as 1881 he inquired in these columns: "Is not the theory of specificity swallowed up in the larger theory of evolution?"—ED. L.

ST. BARTHOLOMEW'S HOSPITAL AND THE NATIONAL GUARD.—Our contemporary *The Hospital* of Nov. 20th contained an interesting and detailed account of the precautions which have been taken at St. Bartholomew's Hospital in anticipation of further air raids on London. The scheme in operation at that hospital originated with the 1st Battalion of the City of London National Guard, whose Commandant, Colonel Cobbett, has made arrangements for a detachment of the Guard to attend the hospital every night. The duties of this detachment are very clearly defined, and the men are prepared by regular drills. On the assumption that in the event of a raid one wing only of the hospital would be hit the maximum number of patients that would have to be removed is estimated at 60. These are divided into three classes, those in bed who cannot walk or be carried; those who can be carried on the back or in a bandy chair; and those who can walk. The mattresses of the first group have under them at all times a special canvas sheet with a wide hem on each side through which poles can be passed, thus forming a stretcher. A crimson tape indicates to the stretcher bearers the helpless patients at a glance. These cases would leave the building by the main staircase, while the second and third classes would leave by the emergency staircases. Special arrangements have been made in case of fire. As our contemporary points out, there is certainly much comfort in the knowledge that six score trained men are keeping watch and ready to help at the first signal of danger.

The War.

THE CASUALTY LIST.

THE following names of medical men appear among the casualties announced since our last issue:—

Wounded.

Lieutenant A. G. Whitfeild, R.A.M.C., 2nd London Sanitary Company (T.F.).

Previously Reported Killed, now Reported Wounded and Prisoner of War.

Lieutenant J. R. Spensley, R.A.M.C., attached 8th Battalion East Kent Regiment.

THE HONOURS LIST.

The following honours have been conferred upon medical officers for gallant conduct and distinguished service in the field:—

The Victoria Cross.

Temporary Lieutenant George Allan Maling, R.A.M.C.

For most conspicuous bravery and devotion to duty during the heavy fighting near Fauquissart on Sept. 25th, 1915. Lieutenant Maling worked incessantly with untiring energy from 6.15 A.M. on the 25th till 8 A.M. on the 26th, collecting and treating in the open under heavy shell fire more than 300 men. At about 11 A.M. on the 25th he was flung down and temporarily stunned by the bursting of a large high-explosive shell, which wounded his only assistant and killed several of his patients. A second shell soon after covered him and his instruments with débris, but his high courage and zeal never failed him, and he continued his gallant work single-handed.

The Military Cross.

Captain Maurice Holdsworth Barton, R.A.M.C. (T.F.), attached 5th Battalion Leicestershire Regiment.

For conspicuous gallantry and devotion to duty at Hohenzollern Redoubt on Oct. 13th, 1915, in tending and bringing in wounded under fire. He also rallied and sent forward men who had become scattered. This is not the first time that Captain Barton's bravery and good work have been brought to notice.

Captain Samuel Russell Foster, 2nd North Midland Field Ambulance, R.A.M.C. (T.F.).

For conspicuous gallantry and devotion to duty at Hohenzollern Redoubt on Oct. 16th, 1915. He went to the relief of an officer and some wounded men who were lying in a trench between the firing lines, passing over a considerable space of open ground in broad daylight under heavy shell, machine-gun, and rifle fire. He spent eight hours in this trench tending severely wounded men.

FOREIGN DECORATIONS.

The King has granted permission to the recipients to wear the undermentioned decorations:—

Conferred by the Emperor of Russia.

Surgeon W. I. Gerrard, M.B., R.N.V.R., Order of St. Anne, 3rd Class.

Temporary Surgeon W. G. Biggar, R.N., Order of St. Anne, 3rd Class.

Fleet-Surgeon H. R. Gardner, M.B., R.N., Order of St. Stanislas, 2nd Class.

Conferred by the King of Serbia.

Surgeon E. R. A. Merewether, M.B., R.N., Order of St. Saba, 4th Class.

BRITISH HOSPITAL SHIPS: ADMIRALTY STATEMENT.

The Secretary of the Admiralty announces that the constant repetition in the German Wireless Press messages of falsehoods concerning British hospital ships necessitates a further categorical denial. There are 42 British hospital ships working to and from Mediterranean—not 70 as stated. No hospital ship has carried other than sick and wounded, nurses, and medical staff, and medical stores. All are fully ballasted to secure safety and comfort, but are *not* deeply laden. On the contrary, they are generally some feet higher than deep draught. All are permanently painted as required by the Geneva Convention, and duly notified to belligerents. No temporary arrangements, such as those suggested, exist. The whole report and its insinuation is absolutely false. Great Britain has strictly adhered to the Geneva and Hague Conventions.

THE CENTRAL MEDICAL WAR COMMITTEE.

A meeting of the Central Medical War Committee was held on Wednesday, Nov. 24th, at which a large portion of the time was occupied by an informal discussion between the Committee and Sir Robert Morant, Mr. J. Smith Whitaker, and Dr. W. Vernon Shaw, representing the National Health Insurance Commission, as to the principles and procedure which should regulate the efforts to recruit more medical men for the army. The administrators of National Health Insurance are under contract to supply medical assistance and advice to insured persons, and are therefore concerned in seeing that certain areas are not unduly depleted of medical men, at any rate, so long as other areas remain apparently better able to yield a quota of military medical officers. As a result of the discussion, the Executive Subcommittee of the Central Medical War Committee will have opportunities of private conference with the officers of the National Health Insurance Commission.

Dr. T. W. Shore, Dean of the Medical School of St. Bartholomew's Hospital, was co-opted a member of the Central Medical War Committee, on the motion of Dr. Frederick Taylor.

The rest of the business was of a confidential character.

Recruiting for the Naval and Military Services.

The following is a further list of those Local Medical War Committees which have furnished their quota:—

Bolton.
Chester.
Finchley and Hendon.
Gloucester.
North Lincolnshire.
Reigate.
Stratford.

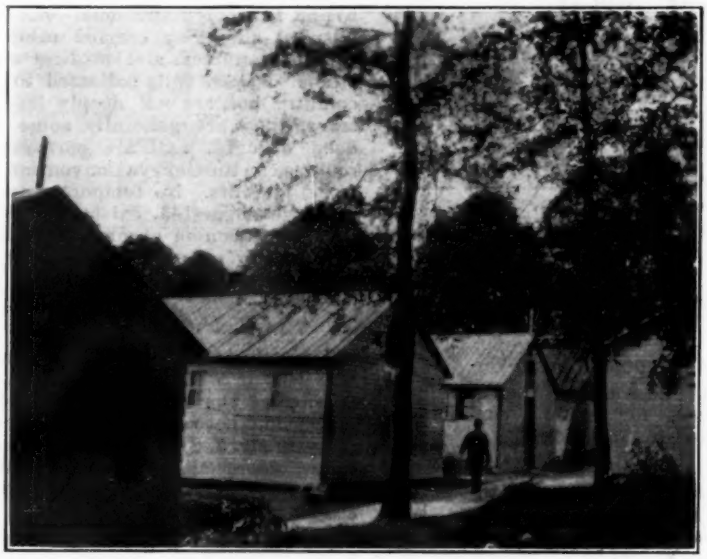
EVACUATION HOSPITALS IN THE ARGONNE.

Comparisons are frequently made by English people between the completeness and even luxury of the arrangements made for the care of the British wounded and the perhaps more Spartan methods made necessary by the greater numbers for which the French have to provide. It is a well-known fact that at the beginning of the war the Service de Santé found itself in an appalling state of unpreparedness. The recuperative power characteristic of the French nation has since enabled the defects so apparent after the battle of the Marne to be everywhere repaired, and while there are few examples of the luxury seen in some of the English hospital trains, the arrangements may be said to be adequate. The following notes on two of the evacuation hospitals in the Argonne inspected by a correspondent in France may serve to show something of the deft methods of adapting existing conditions to present needs, the general spirit of efficiency, and

the fine moral of the medical staff which do honour to the French Service de Santé.

At the first evacuation hospital, installed near the station of a once beautiful town, now a mass of ruins, within a walk of the enemy's lines, the médecin-chef had sought for the wherewithal to organise the disinfection of the vermin-covered soldier. He found it in two outhouses built on to the village laundry, containing a stone trough. In the first outhouse the patient was stripped and his clothes put into the disinfecting oven; in the stone trough he took his tub, and in the other shed he was given his clean clothes and uniform. A large goods-shed next the station was transformed into the hospital. The dusty rafters were cleansed and screened, rows of beds were neatly covered with the brown military blankets, and masses of flowers were arranged by a hospital orderly, who must have been a Parisian florist in private life. The ugly building was thus made almost attractive. All the cases that could be moved were put on the train here and taken down the line to the base hospitals. The transport arrangements were rough but effective The severely wounded were carried on stretchers which hooked into the iron framework in three tiers constructed in each box car to carry 27 men. All the inconvenient changing from stretcher to bed and from bed to stretcher is avoided No pillows are provided for the stretchers, but they are usually given by that private aid which in France so largely supplements any Government deficiency. An orderly is attached to each car and one medical officer to each train. There is no fixed pattern for these hospital trains. The best type has been converted from a passenger train with communicating carriages. The least convenient are those with non-communicating carriages where the "liers," as a British Army Medical nurse called them, are suspended crossways in the ordinary passenger cars. Of the comfort of the English hospital trains it must be admitted there is none, yet

FIG. 1.

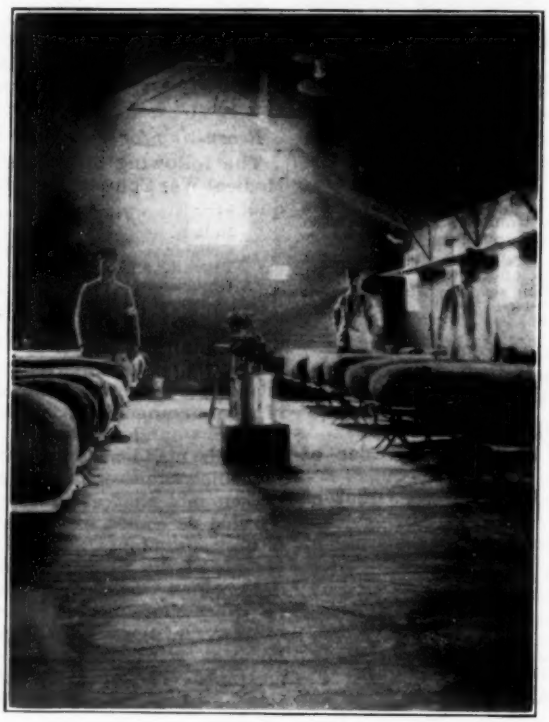


An evacuation hospital in the Argonne.

the men are carefully attended to, and from the thousands of wounded transported in this way during the month that I was in the district not one single complaint was heard.

The second evacuation hospital was opened in the evening of Sept. 16th, 1914 and on an average has handled 300 wounded per day. The huts were erected on a muddy piece of ground quickly turned into a flourishing garden, and in an incredibly short time were ready for use. The illustration given will show the precise neatness of the wards, where even the watering of the wooden floor with disinfectants is done in artistic patterns! (Fig. 2.) The most scrupulous cleanliness is seen everywhere. There is absolutely no luxury, but all essentials are provided and the low death-rate is the best evidence of the excellent care given to the wounded by the staff. Among this latter are no less than 20 priests, whose devotion to their work has won marked praise from their superior officers. In the terrible rush of wounded after the battle of the Marne 2400 were attended to in 24 hours, and during that time not one of the staff even dreamed of taking rest or food. As one of the doctors said, "Rien existait sauf le service." The patients recognise this spirit of devotion, and are profoundly grateful for it. One hears frequent criticism of French hospital methods, and not infrequently this criticism is voiced by French people. Yet surely the last decision must lie with the wounded, who can appreciate more exactly than anyone the value of what is done for them. I have heard the British Tommy grumble in no measured phrase at his lot in one of the biggest and best-run of the English military hospitals in a garrison town, while in many months of work among the French poilus one may safely say that a complaint is never heard. I should have been a little humiliated at this contrast in spirit, if it were not that I know my countrymen, and their odd habit of concealing their better sentiments by "grousing."

FIG. 2.



Interior of one of the huts.

THE POSITION OF MEDICAL STUDENTS.

Something in the direction of improving the position of the third-year student in the way foreshadowed in our leading article last week has already been done, as may be seen from the last War Office assurance. This states that students who at or before the close of the present winter session will be qualified for entry to one of the examinations for the third-year students in medicine, and duly enter for the examination for which they are now studying, will not be attested until after its conclusion, and if they are successful will be included in the class of fourth-year men under Lord Derby's scheme. This disposes of one part of that rather elusive group, the "third-year student," whose seniority varies according to the precise date at which he chose to register, since this is not definitely fixed by law. The third-year men who possess any facility for passing examinations will therefore come into Lord Derby's fourth-year class, and, whether they wish it or no, will be expected to remain at their studies.

We agree with the Principal of King's College, London, Dr. Burrows, that it is the obvious duty of the War Office to advise all medical students to join the Officers Training Corps of their university and thus fit themselves for taking combatant commissions, if and when called upon. Such a policy would enable them to proceed concurrently with their medical training, and they could then be called up in inverse ratio to their seniority. We agree that this course is common ground both of medical and martial efficiency and would help to increase both the supply of officers and doctors.

HOSPITALS IN SERBIA.

As the invasion of Serbia proceeds it is becoming more and more certain that the British hospitals decided to remain where they were and are now in enemy hands. Sir Charles des Graz, British Minister in Serbia, found them in general reluctant to leave their work, and he was himself of opinion that it was wiser for British nurses and doctors to remain than to attempt to leave the country. Lord Robert Cecil stated in Parliament that there appeared to be no reason to believe that the women of the parties would be badly treated. Sir Charles des Graz advises the sending of large supplies of food-stuffs and medical stores to Salonika, in the hope of the line being opened to supply the needs of the units.

An interesting account of the unit under the charge of Mr. James Berry and Mrs. Dickinson Berry, M.D., appears in the November number of the *Magazine of the London School of Medicine for Women*. Writing in September, they state that for the last few weeks there had been a dearth of patients throughout Serbia, but the authorities were nevertheless extremely loth to allow any members of foreign units to leave. It was expected that when fresh fighting occurred, Vrnjatchka Banja would be reckoned a surgical centre, and at least 1000 cases sent there. In the meantime, help was given to the civil population, for whose needs medical attendance was woefully inadequate. Dr. Helen Boyle was starting an out-patient department for this purpose. The unit then contained six hospitals with 300–400 beds, and 60–70 orderlies of Austrian nationality but mostly of Slav race from Bohemia. Boots and shoes continued to be a pressing need, as well as artificial limbs, which were unobtainable in Serbia.

VACANCIES FOR MEDICAL OFFICERS.—There are a few vacancies existing for medical officers in the 3/2nd Home Counties Field Ambulance, R.A.M.C. (T.F.). Candidates must be fully qualified medical practitioners, and willing to undertake foreign service obligation. Applications should be made to the Officer Commanding, Halton Park West Camp, near Tring, Herts.

CONVOY OF MOTOR AMBULANCES: FARMERS' RED CROSS GIFT.—Fourteen motor ambulances of the latest pattern, approved by the War Office, were on view recently in St. James's-square, the last of a convoy of 50 presented by British Farmers to the British Red Cross Society and the St. John Ambulance Association. Each car has accommodation for eight sitting patients or for four stretchers, in addition to an attendant and the driver. The complete convoy has cost £32,500, the price of each car being £450, and with each has been given a sum of £200 for its upkeep for six months. During the day many farmers and landowners from the country who had contributed to their cost inspected the cars, which came from the counties of Wiltshire (4), Warwickshire (2), Hereford (2), Stafford (1), Yorkshire (1), Northampton (1), Somerset (1), Monmouth (1), and Cheshire (1). The review may serve to stimulate others to imitation, and we believe there is no limit to the number of motor ambulances which can be usefully employed.

UNIVERSITY OF EDINBURGH AND THE WAR.—The following members of the medical teaching staff are at present serving with the Forces: Captain Lewis Beesley, R.A.M.C. (T.); Second Lieutenant W. G. Bennett, R.F.A.; Lieutenant F. D. Gavins, R.A.M.C.; Lieutenant W. J. Gardiner, R.A.M.C. (T.); Dr. G. L. Gulland, 1st Lowland Brigade R.F.A. (T.); Colonel R. J. M. Horne, A.M.C., Major, Forth R.G.A.; Major Claud B. Ker, R.A.M.C. (T.); Mr. J. D. Lithgow, Surgeon in Hospital, France; Lieutenant D. Murray Lyon, R.A.M.C., 5th Cavalry Field Ambulance; Captain Bruce McEwan, 8th Royal Scots (T.); Major John Edwin Mackenzie, Artillery Unit, O.T.C., and Adjutant of Corps; Dr. Charles McNeil, Base Hospital, France; Lieutenant W. M. Mitchell, Royal Army Veterinary Corps; Mr. J. W. Struthers, Surgeon, R.A.M.C. (T.), Scottish Red Cross Hospital, Rouen; Captain Lewis Thatcher, R.A.M.C., M.O. General Headquarters, B.M.E. Force; Colonel Alexis Thomson, A.M.S.; Dr. Henry Wade, R.A.M.C., Scottish Horse (T.); Captain A. Pirie Watson, R.A.M.C., 4th Royal Scots (T.); Mr. D. P. D. Wilkie, Surgeon, R.N. Reserve, Portsmouth; Major David Wallace, C.M.G., R.A.M.C. (T.), seconded to Red Cross Society; Dr. Gomer Williams, Surgeon, R.N. Hospital, Plymouth.

The following are attached to 2nd Scottish General Hospital, Craigleith: Captain Edwin Bramwell, R.A.M.C. (T.); Captain G. L. Chiene, R.A.M.C. (T.); Major J. D. Comrie, R.A.M.C. (T.); Captain R. A. Fleming, R.A.M.C. (T.); Major J. W. B. Hodsdon, R.A.M.C. (T.); Captain Harry Rainy, R.A.M.C. (T.); Captain W. J. Stuart, R.A.M.C. (T.); Captain A. Logan Turner, R.A.M.C. (T.).

The following are attached to Bangour Military Hospital: Major F. D. C. Boyd, R.A.M.C.; Lieutenant-Colonel C. W. Cathcart, R.A.M.C. (T.); Captain J. G. Cattanach, R.A.M.C. (T.); Captain Alexander Miles, R.A.M.C. (T.); Lieutenant-Colonel Sir R. W. Philip, R.A.M.C. (T.); Captain H. J. Stiles, R.A.M.C. (T.).

REGISTRATION OF NURSING UNIFORM.—An official announcement appeared on Nov. 22nd to the effect that the uniform of V.A.D. nurses of the British Red Cross Society and the Order of St. John will hereafter be registered. Imitation is now, therefore, an offence under the Defence of the Realm Act, and the V.A.D. nurse may feel that she is afforded the protection to which her self-sacrificing labour entitles her.

THE ARMY'S WINTER KIT.—With the onset of the severe weather public attention naturally turns to the means taken to protect our troops against the rigours of winter warfare in the trenches. We are relieved to see that each soldier at the front is provided by the military authorities with the following articles of clothing: Winter service cap, waterproof cover for cap, cap comforter, body belt, woollen vest and drawers, shirt, cardigan waistcoat, tunic and trousers, fur or leather (flannel lined) jacket, great coat, waterproof cape, fingerless snow gloves, woollen

gloves, socks, puttees, and boots. The authorised scale of equipment allows two shirts and four pairs of socks for each man, leaving to private generosity the supply of mufflers and mittens. Some may wonder why letters still appear begging that articles of warm clothing may be sent to the men of certain regiments, generally by way of ladies connected with the officers of the regiment. The answer is that the winter kit is supplied to the soldiers at the front, and to them only as yet, while the troops in many of our home camps are feeling the sudden rigours of winter severely.

THE GAZETTE OF THE 3RD LONDON GENERAL HOSPITAL, WANDSWORTH.—No. 2 of this journal, the issue for November, is humorous throughout its 24 pages. Although the letterpress for the most part is devoted to purely hospital matters the articles are so well written and broad in interest that there should be no lack of subscribers to the journal, especially as the profits on its sale are devoted to the benevolent fund of the hospital. The illustrations are well done and the editor is to be congratulated upon having two good artists on his staff. The journal can be obtained for 4*d*. post free from the 3rd London General Hospital, Wandsworth, S.W.

FACTORIES AND WORKSHOPS DURING WAR.—We have received a copy of the annual report of the chief inspector of factories and workshops for the year 1914. A glance through its pages shows that the whole work of the Factory Department has undergone a great and remarkable change consequent upon the war. Sir Arthur Whitelegge states that much of the ordinary routine has had to give place to new emergency duties, and the available staff has for the time been greatly reduced. Many of the inspectors and several of the clerical staff joined the forces, and many more have been lent to other departments for special services; thus it has been necessary to readjust the remaining staff from time to time, and to determine in what way their services could be employed to best advantage.

THE ENGINEERING INSTITUTIONS' VOLUNTEER ENGINEER CORPS.—The first meeting of the general committee of this body took place recently, when the presidents of the three premier engineering institutions were present. The recruiting for this corps is not confined to engineers, although they form the majority of its members. Good men are acceptable whether members of these institutions or not, and even those untrained as engineers are welcomed if they answer to certain very reasonable requirements. The meeting was the occasion of some enthusiasm, and an executive committee was formed, consisting of Sir John Snell (retiring president of the Institution of Electrical Engineers) as chairman, Sir Maurice Fitzmaurice, C.M.G. (a vice-president of the Institution of Civil Engineers), Colonel Le Rossignol, R.E., Lieutenant-Colonel C. B. Clay, Mr. L. B. Atkinson, honorary secretary and treasurer; Mr Fleming, and a representative of the Institution of Mechanical Engineers, to be nominated by the president. The report of the commandant (Lieutenant-Colonel C. B. Clay) as to the progress of the corps was most encouraging. To this report he added that an arrangement had been made for sharing headquarters with the 4th Battalion City of London Regiment (Architects' Corps). The premises comprise a spacious drill-hall, and above this are the necessary offices for providing for mess-rooms, common-room, orderly-room, and canteen. On the premises of the London Electrical Engineers (T.F.) some special instruction will be given. Several men have already qualified in this special branch, and parties are engaged each week-end on important work in connexion with the defence of London. Under these auspicious circumstances, and with comfortable and excellent premises for headquarters, the corps should prove attractive to all suitable men who wish to serve their country. The corps will only accept as new members those who are over military age, or disqualified by reasons of health, or who are engaged on war work, and who are not allowed by the Government on that account to enlist in the forces, but whose training in this corps would fit them to take part in the defence of the country in the event of a raid by the enemy, or any other emergency; and would also fit them to volunteer as trained men for service overseas if such a necessity arose at a later period in the war.

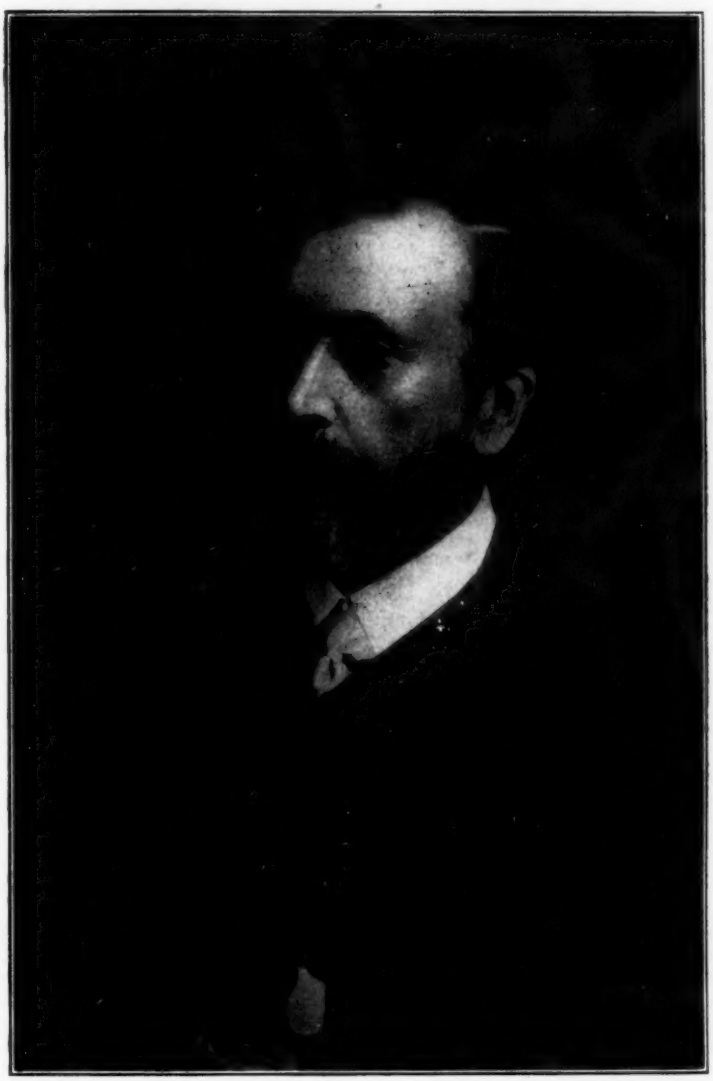
Obituary.

HENRY CHARLTON BASTIAN, M.A., M.D. LOND., HON. M.D. R.U.I., F.R.C.P., F.R.S.,

CONSULTING PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL AND TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.

Henry Charlton Bastian, who died at his house at Chesham Bois on Nov. 17th, was born at Truro on April 26th, 1837. He commenced his education at Falmouth, afterwards going to University College, London. His academic career was quick and distinguished: he graduated M.A. Lond. in 1861, M.B. in 1863, and M.D. three years later. In 1868, when only 31, he was elected a Fellow of the Royal Society. His first important appointment in London was the lectureship on pathology at St. Mary's Hospital where he was also assistant physician, resigning these positions in 1867 on being elected professor of pathology at University College and assistant physician to the hospital. He served the hospital in the capacity of assistant and full physician over a period of 30 years, retiring in 1897 to become consulting physician. In 1887 he vacated the chair of pathology for that of medicine, which he held until 1893. His association with the National Hospital in Queen-square dates from January, 1868; he became full physician in 1887 and retired in 1902 at the age of 65, retaining, however, ten beds until 1912 by special resolution of the governing body. Besides his London degrees in arts and medicine Dr. Bastian held distinctions of many kinds. He was, as has been said, a Fellow of the Royal Society, of the Linnean Society, and of the Royal College of Physicians of London, and was chosen a Censor in 1897–8. He was honorary Fellow of the Royal College of Physicians of Ireland, and was granted an honorary M.D. by the Royal University. Abroad he was a corresponding member of the Royal Academy of Medicine of Turin and of the Medico-Chirurgical Society of Bologna, and an associate member of the American Neurological Association. For many years (1884–98) he was Crown referee in cases of supposed insanity. In June last he was awarded a Civil List pension of £150 a year in consideration of his services to science.

Distinguished as a neurologist, Dr. Bastian's contributions to his subject were indeed large and fruitful, but what he would himself, perhaps, have considered his life-work lay in entirely a different direction. He was the great champion of what is usually known as abiogenesis, the spontaneous origin of life from non-living materials; and he strenuously denied the doctrine of *omne vivum ex ovo*. At the same time he upheld the closely related theory of heterogenesis or the interchangeability of the lowest forms of animal and vegetable life, both amongst themselves and with each other. The list of Bastian's writings given at the end of this notice, a list which is far from complete, will convey an idea of his intense literary activity and will show at a glance the interesting fact that while his writings covered a period of almost exactly half a century, his earlier and later output was chiefly biological and of a controversial character, while the literary result of his period of maturity was a valuable series of neurological works. The inclination of his youth was obscured in force by his clinical studies, but only to resume its force when hospital and medical school ceased to absorb all his time and energies.



[*Photograph by Messrs. Elliott and Fry.*

HENRY CHARLTON BASTIAN, M.A., M.D. LOND., HON. M.D. R.U.I., F.R.C.P., F.R.S.

Dr. Bastian, like Dr. Hughlings Jackson and Sir William Gowers, was a neurologist when neurology was only assuming its position as a science. It is half a century since he made his earliest contributions to the study of the nervous system in health and disease, and though his inquiring mind in later years found other outlets for its energy than in the prosecution of neurological investigations, as late as 1909 we find him writing to a medical contemporary re-emphasising his views on the motor area of the cortex and protesting against misrepresentation of his theory in current literature. It was given to him to observe and to marvel at the phenomenal development of our knowledge of nervous disease over these long years; how much this development was indebted to his own labours in many corners of the field the student of neurology is the first to recognise. In a paper in the Transactions of the Royal Medical and Chirurgical Society for 1867 he clearly described and pictured a degenerated tract in the lateral columns of the cord, known subsequently to 1880 as Gowers's tract owing to its more complete investigation by that observer. The variety of aphasia known as sensory aphasia is often characterised by the superadded epithet "Wernicke's" on the assumption that Wernicke in 1874 was the first to call attention to and explain the form of speech defect known as "word-deafness." But in a paper published in 1869, entitled "On the Various Forms of Loss of Speech in Cerebral Disease," Dr. Bastian described this clinical variety with the utmost precision. His early researches into the difficult subject of aphasia were characterised by that combination of devotion to detail and philosophical breadth of view which is seen at its best in his masterly treatise on "Aphasia and other Speech Defects" (1898). In this volume, long since raised to the select number of the neurological "classics," Dr. Bastian pursued to perfection the clinico-anatomical method to which so many advances in scientific knowledge are due. But through it all runs unmistakeably the trace of the philosophically-minded investigator, who theorises and forms hypotheses, who chooses his cases for clinical experiment, who is alternately analytic and synthetic in his procedure, who sees beyond the facts to their interpretation and their place in a psychological as well as physiological scheme. The treatise on aphasia also exemplified well other traits in Dr. Bastian's genius—his acute critical faculty and the tenacity with which he maintained his views once he was convinced of their accuracy. To the neurologist of to-day the controversies of other years on the exact nature of the motor centres in the cerebral cortex seem, perhaps, rather less stimulating than they must have appeared, no doubt, when the cortex was as a new planet swimming into the ken of the investigator; but no one can peruse Dr. Bastian's contributions to the subject, alike in his published books and in papers to the Royal Society, without being struck by the plausibility of his arguments and the enthusiasm with which he followed what he conceived to be the truth, wherever it might lead him.

While Dr. Bastian's many-sided activities resulted in achievements with which his name will be associated by a wider public, the professing neurologist will remember with gratitude his neuropathological work on acute myelitis, his pathologico-physiological investigations on the phenomena of total transverse lesions of the cord, on the relations of sensory impressions and sensory centres to voluntary movements, on the muscular sense, and other contributions that might be specified. His book on "Paralyses, Cerebral, Bulbar, and Spinal" (1886) is a storehouse of neurological information which has never quite received, we feel, that meed of praise which is its due. His volume on "Hysterical or Functional Paralysis" (1893) contains matter the significance of which is only now beginning to be appreciated.

Dr. Bastian was one of the band of pioneers by whose labours the scientific reputation of the National Hospital in Queen-square was attained. With that institution he was intimately connected for a period of 44 years. Many house physicians and clinical clerks passed out from that hospital deeply impressed with his clinical acumen and his encyclopædic knowledge. As he advanced in years the spirit of investigation, the zeal for wresting still further secrets from nature, burned within him with an ever brighter flame. He was accustomed to have his consulting-room and his laboratory separated merely by a curtain, to pass the more readily from the necessary attendance in the one to the cherished hours in the other. At an age when most men feel they might justifiably rest from their labours Dr. Bastian welcomed his release from hospital duties because of the freedom gained for the prosecution of what he considered his life-work. Had he concentrated all his splendid energies on neurology, no one of his colleagues or pupils ever doubted he might well have been *primus inter pares;* as it is, his name will always be honoured as that of one among the four or five whose work laid the foundation of scientific neurology in England, and whose contagious enthusiasm attracted others to follow along the same lines and to seek to emulate his great achievements.

In 1870 his first controversial work appeared in *Nature*, "Facts and Reasonings Concerning the Heterogeneous Evolution of Living Things." In this he put forth what was perhaps his most important contribution towards the solution of the great question underlying all controversies about germs: whether any line of demarcation exists between animate and inanimate matter—any essential difference between vital and merely physical properties. He detailed an elaborate series of experiments, seemingly performed with all due care, and showing, as far as they went, that low forms of life developed in organic fluids without the presence of air, absolutely *in vacuo*, and in fluids previously raised to temperatures that are universally admitted to be destructive to the vitality of all known germs. Without in any way pledging ourselves to the correctness of Bastian's conclusions, we confessed then to a hope that they might hereafter be proved to be true, as their complete establishment would greatly simplify some of the most difficult problems by which life is beset.

It is something of a tragedy that 33 years later, when Dr. Bastian returned to the attack in a monumental work entitled "Studies in Heterogenesis" (1903), he should find himself a single champion in a field whence all but himself had been driven by the stern logic of facts and the consistent experience of every careful biologist and bacteriologist. Instead of exciting a pleasurable sense of adventure, the book appeared but an attempt to fight over again the battle ably fought, and as we believe won, by Darwin, Pasteur, and their

disciples. The limitations of the methods employed caused Bastian to magnify the importance of what the bacteriologist with better methods regarded as avoidable, and therefore unjustifiable, sources of error. Twelve years more the warrior fought alone for a cause already dead, the last allusion in our columns being a note on the second edition of "The Origin of Life," when we could only say[1]: "The author restates his position.....To our mind the position is quite unchanged, and we ourselves still remain unconvinced, save, of course, of the courage and good faith of Dr. Bastian."

Now that Dr. Bastian has passed to rest, it is easier to realise the magnificent courage which was his in this single-handed combat and the value of such an example to all earnest seekers after truth. In his inaugural address to the students of University College in 1871 on the origin of epidemic diseases he expressed the hope that his theme might "suffice to inspire" them and make them "feel the urgent need for diligent, patient, honest work all through their career": a sentence truly descriptive of his own life.

Of works of a miscellaneous character outside the two main lines of his literary activities, we may mention: a monograph on the Anguillulidæ, of which he discovered 100 new species of one family; a monograph contributed to the Linnean Society on Nematoids, parasitic and free; and a volume on the Flora of Falmouth.

He married Julia, third daughter of the late Charles Orme, and had three sons and a daughter. His widow survives him. One of his sons is Staff-Surgeon in the Royal Navy.

List of Dr. Bastian's Writings.

1864. On the Mode of Origin of Secondary Cancerous Growths (Med. Mirror, vol. i., No. 10). *1865.* A Monograph on the Anguillulidæ; and On the Specific Gravity of Different Parts of the Human Brain (Journal of Mental Science). *1866.* On the So-called Pacchionian Bodies (Trans. Micro. Soc., vol. xiv., n.s.). *1867.* On the Pathology of Tubercular Meningitis (Edin. Med. Jour., April, 1867). *1868.* Congestion of Brain (Reynolds's Medicine, vol. ii.). *1869.* On the "Muscular Sense" and on the Physiology of Thinking. *1870.* Facts and Reasonings concerning the Heterogeneous Evolution of Living Things (Nature). *1871.* The Modes of Origin of Lowest Organisms, including a Discussion of the Experiments of Pasteur and a Reply to Huxley and Tyndall; Epidemic and Specific Contagious Diseases, Considerations as to Their Nature and Mode of Origin; and Cirrhosis of Lung (Reynolds's Medicine, vol. iii.). *1872.* On Some Heterogenetic Modes of Origin of Flagellated Monads, Fungus Germs and Ciliated Infusoria (Roy. Soc. Proceedings); and The Beginnings of Life, being some account of the Nature, Modes of Origin, and Transformations of Lower Organisms. *1874.* Evolution and the Origin of Life. *1875.* On Paralysis from Brain Disease in its Common Forms. *1877.* On the Conditions Favouring Fermentation and the Appearance of Bacilli, Micrococci, and Torulæ in Previously Boiled Fluids (Linnean Society's Journal). *1880.* The Brain as an Organ of Mind (Internat. Scient. Series, xxix., fourth edition). *1886.* Paralyses, Cerebral, Bulbar, and Spinal: A Manual of Diagnosis for Students and Practitioners. *1892.* On the Neural Processes Underlying Attention and Volition (Brain, Part 1). *1893.* Various Forms of Hysterical or Functional Paralysis. *1897.* The Lumleian Lectures on Some Problems in Connexion with Aphasia and other Speech Defects (THE LANCET, April 3rd, 10th, 24th, and May 1st, 1897); and On a Case of Amnesia and other Speech Defects of 18 Years' Duration, with Autopsy (Med. Chi. Trans., vol. lxxx.). *1898.* A Treatise on Aphasia and other Speech Defects. *1903.* Studies in Heterogenesis. *1905.* The Heterogenetic Origin of Fungus Germs and Monads (Annals and Mag. of Nat. Hist.); and the Nature and Origin of Living Matter. *1907.* The Evolution of Life. *1911.* The Origin of Life, being an Account of Experiments with Certain Superheated Saline Solutions in Hermetically Sealed Vessels; second edition, 1913.

EDWARD LIVINGSTON TRUDEAU,

SARANAC LAKE, N.Y.

WE regret to learn the death of Edward Livingston Trudeau, who was born in New York on Oct. 5th, 1848, the son of Dr. James and Cephise (Berger) Trudeau. He was educated at Columbia College and graduated in medicine at New York in 1871. He was also M.Sc. (Columbia University, 1899) and LL.D. (McGill University, Montreal, 1904). In the same year he married Charlotte G. Beare. Settling at Saranac Lake on account of ill-health, he founded there the Adirondack Cottage Sanitarium for the treatment of incipient pulmonary tuberculosis in working men and women, the first institution in America to attempt the cure of tuberculosis by climatic and open-air methods. In 1894 he instituted the Saranac Laboratory for the Study of Tuberculosis, again the first of its kind. Dr. Trudeau's life is in reality the story of the fight against tuberculosis in America, and we leave the telling of it to Sir William Osler, whose appreciation of his personal friend follows.

"In the death of Dr. E. L. Trudeau, at the age of 67, the United States has lost one of its strong men whose life and work has been an inspiration to the profession. Stricken with tuberculosis in 1872, he went into the Adirondack wilderness with little left but hope. For more than 43 years he fought against a relentless foe, often for long periods disabled, but always cheerful and courageous. Little did he think when driven from a brilliant career in New York that he was entering a land of promise, the Joshua of a movement of national importance, and that he was destined to become an authority of world-wide reputation in the very disease which had made him flee for his life. A strong personality, faith, and human sympathy made him the centre of a group of men who, early in the 'eighties,' strove to do something practical for the poor consumptives. The outcome was the Adirondack Cottage Sanitarium, the first of its kind in America. It became and remains a model. A strong capacity for warm friendship early brought to his side such men as Dr. Janeway, Dr. Loomis, Anson Phelps, and Chas. M. Lea, who gave professional and financial aid. It is hard to say whether he owed more to the public who gave him cash, or to his brethren whose confidence he won early and maintained to the end. Amid the worries of patients, ill-health, and lack of funds, Dr. Trudeau stuck close to the scientific side of the work, and in 1894 a friend gave the money to found a laboratory for the study of tuberculosis, from which year by year many valuable researches have come. It may be truly said that about him has centred the great battle against tuberculosis in the United States. His was the faith that saves—faith in the success of the methods he knew so well, the faith that gave hope to those from whom hope had flown, and above all, the contagious faith in himself that rallied to his support his colleagues all over the country, and has made the Adirondacks a veritable Mecca for tuberculous patients.

How true it is that ill-health, the bridle of Theages Plato calls it, may concentrate a man's resources, and bring out qualities of work, the fruits of the spirit, that may be missed in the hurly-burly of the work-a-day world. This was the case with Edward Trudeau. Of no man I have met are the noble words which Matthew Arnold uses of his father more true, and they will find an echo in the hearts of thousands to whom his life and words have been a comfort:—

> We were weary, and we
> Fearful, and we in our march
> Fain to drop down and to die.
> Still thou turnedst and still
> Beckonedst the trembler, and still
> Gavest the weary thy hand.

Only an idealist can be an optimist. Trudeau had a fine outlook on life. Once he wrote me, 'I have been in the grip of the tiger and in bed now for five weeks, but if my body is harassed and shrivelled by disease my soul is full of hope.' In the United

[1] THE LANCET, April 5th, 1913, p. 970.

States and Canada we all loved him for his strong love of all that was best in the profession. In one letter to me he said: 'Are there no other ideals than efficiency and success? I know you hate sentiment; but with some of us sentiment stands for a good deal, and is a real factor in the problems of life; it is often the very spirit of that mysterious "ego" which governs our actions and shapes our lives after certain ideals; and to my mind no field offers such possibilities for the development of high ideals as does the medical profession.'" W. O.

FREDERICK H. DALY, M.D. R.U.I., J.P.

BY the death of Dr. F. H. Daly on Nov. 10th, at his residence in Amhurst-road, Hackney Downs, the medical profession in the north-eastern district of London has lost one of its most widely esteemed members. Dr. Daly, who was 73 years of age, for the last 50 years had not only practised in that busy and growing part of London but had taken a prominent part in matters that concerned the welfare of the community. He was for long a justice of the peace for Middlesex and London, and took the keenest interest in his multifarious duties as a magistrate. He served as president of the Tottenham Medical Society and as vice-president of the local branch of the British Medical Association. As certifying factory surgeon he performed most useful work, and whether as chairman of the bench of magistrates, as alderman for the borough of Hackney, or as guardian his public service was of the highest character and will not soon be forgotten.

Dr. Daly was born in county Cork in 1842, and qualified both in Ireland and Edinburgh, subsequently studying at the London Hospital, for which institution throughout his life he retained a warm affection. His two sons joined the London Hospital. The annual old students' dinner would not have been complete without his presence—indeed, for over 20 years he did not miss a single one of these gatherings. Dr. Daly was Irish, and some of the best qualities of his race were illustrated in him. With a strong sense of humour and a ready wit, he had an instinct for warm-hearted friendship and remarkable quickness to perceive the right course to adopt whether in difficult professional cases or in public affairs. His public duties, in addition to the strenuous work involved by a medical practice which covered a wide area, allowed him but little time for contributing to medical literature. Nevertheless he wrote some valuable papers in the Transactions of the Clinical and Obstetrical Societies, as well as for the medical journals. He was a physician of great acumen and practical skill, and his loss will be felt by a wide circle of his friends and patients.

HUGH BROWN CURRIE, M.B., C.M. GLASG.

THE death of Dr. H. B. Currie on Oct. 9th is announced from Johannesburg following an operation for appendicitis. Dr. Currie graduated in 1894, and subsequently held the appointments of assistant medical officer to the Belvidere Fever Hospital, Glasgow, of assistant physician to the Crichton Royal Institution, Dumfries, and of senior resident physician at the Glasgow Western Infirmary. A few years prior to the South African War Dr. Currie had, for health reasons, to relinquish the prospects of a distinguished professional career in Scotland and proceeded to South Africa. He went through the siege of Ladysmith as medical officer of the Natal Carbineers, and was afterwards surgeon-captain in the Imperial Light Infantry. On the cessation of hostilities Dr. Currie became a major in the Transvaal Volunteer Medical Service Corps. He was for some time physician at the Johannesburg General Hospital, and on his retirement from that office he was appointed honorary consulting physician. He was also a member of the hospital board, and medical officer of the Johannesburg Post Office. He contributed a few articles on medical subjects to the *Transvaal Medical Journal*.

There was a large and widely representative gathering at the funeral, for while in character Dr. Currie was unassuming, his sterling qualities were widely recognised. Nearly every medical man in the Johannesburg district followed the remains to the grave. Dr. Currie leaves a widow and three daughters to mourn their loss.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates were successful:—

Surgery.—L. M. Arnold (Sections I. and II.), Cambridge and St. Mary's Hospital; G. T. Baker (Sections I. and II.), Middlesex Hospital; W. F. R. Castle (Sections I. and II.), Cambridge and London Hospital; C. E. Clarke (Sections I. and II.), Bombay; W. Fox (Section I.), Charing Cross Hospital; and L. S. Goss (Sections I. and II.), Oxford and Middlesex Hospital.

Medicine.—I. H. Lloyd (Section II.), Westminster Hospital; J. Remers (Sections I. and II.), Manchester; A. J. A. Wilson (Sections I. and II.), Royal Free Hospital; and F. H. Young (Sections I. and II.), St. Bartholomew's Hospital.

Forensic Medicine.—E. V. Beaumont, St. Mary's Hospital; M. J. Byrnes, Cork; J. Fox-Russell, Middlesex Hospital; B. Ghobrial, Charing Cross Hospital; G. P. K. Grey, Middlesex Hospital; W. J. May, London Hospital; J. Remers, Manchester; A. J. A. Wilson, Royal Free Hospital; and F. H. Young, St. Bartholomew's Hospital.

Midwifery.—J. S. Bhajiwalla, London Hospital; M. J. Byrnes, Cork; and C. G. G. Winter, St. Mary's Hospital.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—L. M. Arnold, G. T. Baker, C. E. Clarke, L. S. Goss, and F. H. Young.

UNIVERSITY OF LONDON.—At the Third (M.B., B.S.) Examination for Medical Degrees for internal and external students held recently the following candidates were successful:—

Honours.—James Fanstone (distinguished in medicine and pathology), London Hospital; Geoffry Challen Linder (distinguished in medicine, pathology, and surgery; University medal), St. Bartholomew's Hospital; and Edith Marjorie Martland (distinguished in medicine), London (Royal Free Hospital) School of Medicine for Women.

Pass.—Frederick Alexander Beattie, Guy's Hospital; Marion Mildred Barrow Burt, University of Birmingham; William Burt, St. Thomas's Hospital; Dorothy Chick, London (Royal Free Hospital) School of Medicine for Women; John Nissen Deacon, London Hospital; Cyril Henry Edwards, Guy's Hospital; Annie Mary Forster, Hilda Grace Johnson, Helena Rosa Lowenfeld, and Mary Constance Poonen, London (Royal Free Hospital School of Medicine for Women; George John Chase Smyth, Westminster Hospital; Harold Eustace Thorn, St. George's Hospital; and Mary Woods, London (Royal Free Hospital) School of Medicine for Women.

The following candidates have passed in one of the two groups of subjects, but have not yet completed the examination.

Group I.—Richard William Annison, Middlesex Hospital; Tudor David Bowen and Christopher Ignatius de Silva, University College Hospital; David Sydney Graves, Guy's Hospital; Frank Keith Hayman, University of Bristol; and Hannah Grace Morland and Kathleen Hazel Parkinson, London (Royal Free Hospital) School of Medicine for Women.

Group II.—Irene Bastow, London (Royal Free Hospital) School of Medicine for Women; Claude Wells Woolloton Baxter, Guy's Hospital; William Henry Dupré and Philip Oswald Ellison, St. Bartholomew's Hospital; Showkiram Sahijram Malkani, University College Hospital; Allan Hawkins Morley, London Hospital; and Innes Hope Pearse, London (Royal Free Hospital) School of Medicine for Women.

N.B.—This list, published for the convenience of candidates, is issued subject to its approval by the Senate.

UNIVERSITY OF BRISTOL.—The Long Fox lecture will be delivered by Mr. F. Richardson Cross at the University on Wednesday, Dec. 1st. The subject of the lecture will be "The Evolution of the Sense of Sight." All medical men and students are invited to attend.

CENTRAL MIDWIVES BOARD.—A meeting of the Central Midwives Board was held at Caxton House, Westminster, on Nov. 18th, with Sir Francis H. Champneys in the chair. A letter was considered from Mrs. Edith V. Reid, honorary secretary of the Swansea District Nursing Association, suggesting that the number of cases of personal delivery required by a candidate entering for examination should be reduced during the period of the war from 20 to 15 in order to meet the difficulties arising out of the present decline in the birth-rate. The Board decided that the honorary secretary of the Swansea District Nursing Association be informed that the Board regrets that it is unable to adopt the suggestion of the association. It is, however, glad to inform it that the Board has this day received from the Privy Council its approval of the scheme suggested by the Board on June 17th for prolonging the training of pupil midwives to six months. It hopes that this will suffice to reduce the inconvenience complained of. A communication was received from the Clerk of the Council transmitting an Order of Council approving certain new rules framed by the Board, extending the period of training of pupil midwives from three to six months, to come into force on July 1st, 1916. A letter was considered from the county medical officer of health of Leicestershire inquiring whether certain cancer conditions come within the provisions of Rule E. 5, as being conditions "supposed to be infectious." The Board directed that the county medical officer of health of Leicestershire be informed that the conditions specified come within the scope of those referred to in Rule E. 5 as being "liable to be a source of infection." A letter was considered from the medical officer of health of the county borough of Leicester, asking to what extent a midwife is under statutory obligation to carry out the orders of a medical practitioner who has been called in to a lying-in woman. The Board directed that the medical officer of health of the county borough of Leicester be informed that according to Rule E 6 the midwife must (after a doctor has been sent for) "await his arrival and faithfully carry out his instructions": according to Rule E. 5 she cannot attend any other maternity patient without adequate disinfection. But for the doctor to dismiss the midwife because the patient is believed to have puerperal fever, and in the absence of proved neglect, is nowhere sanctioned by the rules. A letter from the medical officer of health of Stoke-on-Trent called attention to the fact that a midwife approved by the Board for the training of pupil midwives at Stoke-on-Trent has no provision in her house for a separate bedroom for her pupils. The Board decided that the medical officer of health of the county borough of Stoke-on-Trent be informed that the Board cannot approve of any midwife training pupils unless she has proper domestic accommodation for them, which does not appear to be the case in the present instance, and that the midwife be so informed.

REGISTRATION OF MASSAGE ESTABLISHMENTS.—The clerk of the London County Council calls attention to Paragraph No. 9 (*d*) of the London County Council (General Powers) Act, 1915 (Part V.). According to this, it will be a penal offence after Feb. 1st, 1916, for any person carrying on an unregistered establishment for massage or special treatment to publish any advertisement of such establishment after a period of seven days from the receipt of a notice in writing from the Council or the publication of notice in the *London Gazette* that the registration of such establishment has been refused or cancelled.

BOOKS FOR BRITISH CIVILIAN PRISONERS OF WAR.—An appeal is made by the Board of Education for books of an educational character for the British civilian prisoners of war (of whom there are some 4000) now interned at Ruhleben, in Germany. The educational work in the camp is divided into nine sections, and covers languages, art, science—in fact, nearly all the usual subjects of a school or college curriculum. Persons willing to contribute either books or money to this interesting and most deserving effort may obtain an informing circular from Mr. Alfred T. Davies, Board of Education, Whitehall, S.W.

AN electro-therapeutic department has been established at the Male Lock Hospital, Dean-street, W., for the treatment of gonorrhœa. The department is in charge of Dr. Charles Russ.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Midwives (Scotland) Bill.

Mr. MCKINNON WOOD, the Secretary for Scotland, has introduced into the House of Commons a Bill "to secure the better training of midwives in Scotland and to regulate their practice." It has been read a first time.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 17TH.

Deaths from Sickness in Dardanelles Force.

Replying to Mr. JOYNSON-HICKS, Mr. TENNANT (Under Secretary for War) wrote: Up to date about 55 officers and 1700 other ranks have died with the Mediterranean Expeditionary Force from causes other than wounds. These figures include the Royal Naval Division. The figures which I give, although not precise, are substantially accurate. I am unable at present to state the number of those who have died since leaving the Mediterranean Expeditionary Force.

Invaliding from the Dardanelles.

Sir C. KINLOCH-COOKE asked the Under Secretary for War whether he would consider the advisability of not sending back to the Dardanelles men who had been invalided home for dysentery and enteric, but to employ them in some other theatre of war where there would be less danger of suffering a relapse from want of suitable food.—Mr. TENNANT replied: Careful attention will be given to this point in each individual case.

Sir C. KINLOCH-COOKE asked the right honourable gentleman whether he was aware that a considerable number of officers and men were being sent home from the Dardanelles suffering from dysentery and enteric; that these officers and men were being fed with ordinary rations while on their homeward voyage, and that these rations often consisted of tinned food, quite unsuitable for invalids; that there was little or no provision of medical necessaries on board for cases of this kind, and that owing to these facts many deaths had occurred that might have been avoided; and whether he could see his way to remedy this state of affairs.—Mr. TENNANT said in reply: The answer to the first part of the question is in the affirmative. I should prefer to postpone my answer to the other parts until I have had time to make proper inquiry, but as at present advised I do not think the generalisation which the honourable Member makes is well founded.

Medical Examination of Recruits.

Mr. MORRELL asked the Under Secretary for War whether he had arranged for the discharge of those men who had remained, since the date of their enlistment, at the depôts of their regiments because they were found to be unfit for active service; whether in some regiments there was a considerable number of such men who ought never to have been accepted as recruits; and whether any steps were now being taken to secure a more efficient medical examination.—Mr. TENNANT answered: A soldier who is unfit for active service abroad is not necessarily discharged. If he is fit for garrison duty abroad or for service at home he is retained accordingly. If unfit for any of these forms of service he is discharged. A certain number of men have been accepted in the past as recruits who have been found after enlistment not to be in all respects fit for service. These men, if unfit for any form of service, have been discharged. Every endeavour is made to secure efficient medical examination of recruits, and we are not aware that there is now any ground for complaint in this respect.

Mr. MORRELL: Is it not the fact that examining doctors are paid by results, with the consequence that they have a direct inducement to pass as many men as possible?—Mr. TENNANT: I am not quite certain. Perhaps my honourable friend will give me notice.

Mr. BOOTH: Is the right honourable gentleman aware that some of the persons discharged from sanatoria as partially cured are passed by the doctors?—Mr. TENNANT: I should like notice. I cannot possibly give an answer.

Vaccination in the Territorial Force.

Answering Mr. CHANCELLOR, Mr. TENNANT said: Liability to vaccination is not a condition of enlistment in the Territorial Force. No alteration has so far been introduced under Lord Derby's scheme in the conditions of enlistment into the Territorial Force.

Treatment of Tuberculosis in Scotland.

Mr. CURRIE asked the representative of the National Insurance Commissioners whether the three cases receiving domiciliary treatment under the Insurance Committee for the county of Renfrew in the year 1913 cost on an average £327 11*s.* 5*d.* each; whether it had been made known that

the estimated deficit of this commitee's tuberculosis treatment fund for the current year amounted to £3678 10s. 11*d.*; whether the Treasury had been asked to pay one-half of this deficit and had agreed to do so; and whether the Treasury had received other requisitions to the same effect from other quarters and had agreed to make other such payments and, if so, to what extent.—Mr. C. ROBERTS replied: For reasons which I have formerly indicated I cannot admit the validity of the calculation made in the first part of the question. The answer to the remaining parts of the question is in the affirmative, but I may remind the honourable Member that moneys specifically allocated to the remuneration of doctors on the panel in respect of their responsibility for the domiciliary treatment of tuberculous insured persons cannot be applied in meeting expenditure sanctioned in accordance with Section 17 (2) and (3) of the National Insurance Act, 1911. I understand that expenditure under those subsections has been sanctioned in 13 cases in Scotland in addition to that mentioned in the question.

Mr. CURRIE also asked the honourable gentleman whether representations had reached him from medical men and others having practical experience of the working of the National Health Insurance Act, that the continuance or extension of the domiciliary treatment of consumption was fraught with danger to the public health when applied to thickly populated areas where the tenement system of housing common in many towns in Scotland prevailed; if so, whether these representations had been remitted for report to the Scottish Commissioners; and whether the opinion of these commissioners on the point had been made public.—Mr. ROBERTS said in reply: I have not seen any statement in the terms referred to in the question, nor do I think that any such general expression of a view adverse to domiciliary treatment is supported by the facts. The particular form of treatment most suitable in a given case must vary according to the condition and surroundings of the patient, but I may point out to the honourable member that the Departmental Committee on Tuberculosis reported that in their opinion it was of primary importance to the lasting success of any scheme for dealing with tuberculosis that it should enlist the hearty cooperation and stimulate the interest of general medical practitioners. The answer to the second part of the question is in the negative. The last part does not therefore arise.

Sir H. CRAIK: Was not one of the inducements held out for the passage of the National Insurance Act that the domiciliary treatment of tuberculosis should come to an end?—Mr. ROBERTS: No; that is not the case. Domiciliary treatment and institutional treatment are equally parts of the sanatorium benefit.

Mr. CURRIE asked the honourable gentleman whether his attention had been drawn to a complaint by the Insurance Committee at Kilmarnock, stating that the cost to that committee of certain tuberculosis cases had averaged over £63 each; whether the agreements in terms of which payments on this scale had been made in various parts of the country resulted from arrangements arrived at without the consent of Insurance Committees; whether the payment of £63 per case referred to represented the figures for the year 1913, and thus exemplified the working of the Act prior to the outbreak of war; whether the corresponding figure for Kilmarnock in respect of the year 1914 was now available; whether payments on this scale were to be regarded as of common occurrence throughout the country or as due to altogether exceptional circumstances prevailing in Kilmarnock and district; and, if so, whether the ordinary vital statistics applicable to the district afforded any explanation of these circumstances.—Mr. ROBERTS replied: The answer to the first part of the question is in the affirmative. As regards the second, fifth, and sixth parts of the question, the arrangements in respect of the domiciliary treatment of tuberculosis form part of the general terms of remuneration of medical practitioners under the Acts. These terms were fully explained to the House and to the Advisory Committee by the Minister of Munitions (Mr. Lloyd George) on Oct. 23rd, 1912. The figure quoted by the honourable Member in the third part of the question, of which I must not be understood to accept the implications, relates to the year 1914, and the fourth part of the question accordingly does not arise.

Mr. BOOTH: Is not my honourable friend aware that the present practice is departing considerably from what was desired by the present Minister of Munitions?—Mr. ROBERTS: The present practice is based on the arrangement which my right honourable friend sanctioned at the time.

Sir J. D. REES: Is any general effort being made to reduce expenses, particularly in Scotland, where they mount up to these very large figures?—Mr. ROBERTS: It is impossible to revise the arrangements sanctioned by the medical profession in view of the absorption of the medical profession in the war.

Medical Students and the War.

Mr. TREVELYAN asked the Under Secretary of State for War whether he was aware that a special attempt was being made to enlist medical students of the first, second, and third years at Cambridge; that the supply of medical students had already been very seriously depleted; and that if this policy was continued the entire supply from Cambridge was liable to be cut off for three or four years; and whether, seeing that it was in the national interest during the war to have a large supply of young doctors in training and essential after the war to have no reduction of the medical profession in the country to cope with epidemics which were frequently consequent on war, the Government would not only suggest to Lord Derby to cease this recruitment, but take steps to increase the supply of students for the medical profession.—Mr. TENNANT replied: I would refer the honourable gentleman to the reply I gave to the honourable Member for Blackburn on Nov. 2nd. I may add that since that date Lord Derby had seen the Presidents of the Colleges of Surgeons and Physicians and others, and the present view is that first-, second-, and third-year students should enlist or qualify for commissions.

At a later stage Mr. SNOWDEN, speaking on the third reading of the Appropriation Bill, said that he wished to obtain from the Under Secretary for War a statement on the changed attitude of the Government in reference to the enlistment of medical students. In June the right honourable gentleman had said that any expression of official opinion which might seem to place on medical students the obligation of taking up immediate military duty would hardly be in the interests either of the army or of the community as a whole. This month, however, the right honourable gentleman had stated that the view of the War Office at the present time was that the fourth- and fifth-year students should continue their studies, but that students in the first, second, and third years must consider for themselves what answer they should make to the recruiting appeal addressed to them, and not regard themselves, so far as the War Office was concerned, as under the duty of continuing their medical studies. This war (the honourable Member continued) was going to lead to a great many very serious problems of which no foresight and no deliberate action could possibly get rid, and the gravity of those problems ought to be remembered. He submitted that by the new action of the War Office very serious problems in the future were quite unnecessarily being raised. Lord Derby had told a deputation that it was the duty of many good students other than those in the fourth and fifth years of their studies to join His Majesty's forces. He understood that intimation was made to all the medical colleges in the country that the first-, second-, or third-year students must be notified that they would be permitted by the War Office to enlist. This intimation was made to them, he knew in many cases, in a way which left the students no alternative but to enlist. This new policy on the part of the War Office in regard to first-, second-, and third-year medical students was a cause of great anxiety to the medical profession. The honourable Member then referred to the published newspaper correspondence on the subject. If this policy of feeding the ranks with medical students was going to be pursued the situation in two or three years' time would be that those who had entered the army would not return to their course of training after the war was over. It had been pointed out by Professor Shipley that very often epidemics followed a war, and that if an epidemic were to break out among the civil population of this country at the present time there were not sufficient medical men in the country to deal with it. There was then the question of infantile mortality, and it was the fact that there had been during the last 12 or 18 months a most painful increase in the infantile death-rate. Although he did not say that that was due altogether to the difficulty of getting doctors and to the shortage of doctors, he thought there was no doubt that it was to some extent due to that cause. He would therefore ask the War Office to reconsider their attitude. The number of students of the first, second, and third years who would be available for military service was so small that if they were to enlist they would have no appreciable effect whatever in helping us to win the war whereas they would be a very serious loss otherwise.

The Attitude of the War Office.

Mr. TENNANT (Under Secretary for War) replied: The honourable Member has made a very weighty appeal to me to reconsider the decision which has been come to in the course of the last two or three months. I will be quite frank. I may point out that the position in June was a somewhat different position from the position in October and November. The difficulties which we conceived in supplying men for the army and the difficulties which we saw in getting good officers to command those men are factors which I should like my honourable friend to bear in mind. My honourable friend has said that in coming to these conclusions we do so on the influence of Lord Derby. I have a great regard for the opinion of Lord Derby, but it was not in relation to any influence of his that this was done. It was really my noble friend, Lord Kitchener,

who decided about the fourth- and fifth-year students before Lord Derby came to the War Office. That, however, is a minor point. The honourable gentleman said that by this decision we were raising unnecessarily new problems of great difficulty which would come up for solution one or two years after the war is over. I quite agree with him that the problems that will be raised for two or three years after the war will exercise the judgment of statesmen and require all the ingenuity and statecraft of the whole of us to deal with. When he says that we are unnecessarily raising new problems I really do join issue, and I repeat what I have said that our duty is to win this war first. My honourable friend does not think that these medical students are of real importance in the enormous army which we are raising. Medical students, first of all, are men of imagination and of splendid physique. Everyone who knows anything about them knows that they are full of pranks, full of high spirits, full of activity, both mental and physical, and that they are just the kind of fellows to make the finest officers. I suggest, as we are undoubtedly finding ourselves coming to the end of what is called that class of officer, the man who commands at once allegiance from his fellow men, as we are arriving at the end of that class, I would ask my honourable friend to allow us to proceed upon the policy I have announced, which is to recommend first-, second-, and third-year students to enter the army. I can quite understand that there are fewer young men entering the medical schools and the universities at the present moment, but I do not think that is due at all to any disinclination to embark upon the splendid and noble study of medicine. On the contrary, it is merely a symptom of what is seen throughout the whole of the universities to-day, since you simply cannot get young men to take a two or three or four years' course as they are all looking forward to joining the combatant ranks of the country, and small blame to them I say. Therefore, I do not think that my honourable friend ought to be alarmed on this score. I quite agree with him that there may be after the war great difficulty in finding a sufficient number of doctors. I hope very much that the whole of these young men will not be annihilated, but that a very large proportion of them will resume their studies, and will enter upon the profession which they have chosen after the war is over. But although I dare say it is not for one in my position to say "Sufficient unto the day is the evil thereof," we have really to do everything in our power to bring all the best material we can into the army in order to win this war. I really am sorry not to be able to meet my honourable friend's view, because he has brought very strong arguments to bear upon it. As at present advised I do not see how I can meet my honourable friend's view.

Sir P. MAGNUS said that he agreed with nearly every word which had fallen from the right honourable gentleman. He knew quite well that young medical students were eager to join His Majesty's Forces, but he knew also as a fact that the effect of so many medical students joining the forces would cause a considerable shortage of medical men some years hence. The only thing he would ask the right honourable gentleman to do at present was to consider whether the exemption which he understood that the right honourable gentleman and the Secretary of State for War were disposed to give to fourth- and fifth-year men should not be extended to third-year students. It would not make much difference, but the third-year students, if they were exempted, would add considerably in the course of two or three years to the number of medical men who would be ready to take their place in the profession. If the right honourable gentleman could make a concession of that kind exempting third-year students from the necessity or obligation to join His Majesty's forces, the views of many would be adequately met.

Mr. TENNANT: I shall be very glad to consider that. I cannot say more.

The subject then dropped.

MONDAY, NOV. 22ND.

Advisory Board of the Army Medical Services.

Replying to Mr. SHIRLEY BENN, Mr. TENNANT said: There are 11 members of the Advisory Board of the Army Medical Services, seven military and four civilian. The civilian members are paid £200 a year each for their services on the Board. Two military members receive extra pay of £150 a year, and five receive nothing for this duty. The number of meetings of the Board was in 1913 ten, and in 1914 seven. No formal meetings have been held in 1915, but all the paid members have been constantly consulted, and have given very valuable advice throughout the war.

TUESDAY, NOV. 23RD.

Frost-bite in the Trenches.

Answering Mr. THOMAS, who asked whether there was already a number of men in the British hospitals in France suffering from frozen feet as a result of not being supplied with rubber knee-boots, Mr. FORSTER (Financial Secretary to the War Office) said: I regret to say that there are a certain number of men in hospital in France suffering in their feet, but there is nothing to show that this is due to the absence of rubber boots. Rubber boots of special pattern reaching to the top of the thigh are supplied to men in the trenches.

Pay of Royal Army Medical Corps Officers in Egypt.

Mr. WATT asked the Financial Secretary to the War Office whether colonial allowance of 3*s.* a day was paid in Egypt to all officers of the Royal Army Medical Corps whose stay in Egypt exceeded 14 days; whether this applied to temporary lieutenants there whose stay in that country often extended to six months or a year; if not, would he say why this exception was made to this particular class of officer; and would he see that in future equality of treatment of all officers is carried out.—Mr. FORSTER answered: Temporary lieutenants serve under a special contract at the rate of pay explicitly fixed to cover all cash allowances.

Domiciliary Treatment of Tuberculosis.

Mr. CURRIE asked the Representative of the National Health Insurance Commissioners to state the total amount payable to panel practitioners for the year 1914 in respect of the domiciliary treatment of tuberculosis; how many applications for sanatorium benefit had been made to insurance committees where domiciliary treatment had been granted for 1914; what was the average period of treatment granted and the total number of visits and attendances paid by the practitioners on the patients who were granted domiciliary treatment; and how many panel practitioners actually gave domiciliary treatment under arrangements made by the committees.—Mr. C. ROBERTS said in reply: The precise figure asked for in the first part of the question cannot be stated in advance of the final settlement of medical practitioners' accounts for the period named. The particulars asked for in the second part will be included in a return as to the operation of the benefit which is in course of preparation. I am not in possession of the remainder of the information for which the honourable Member asks.

WEDNESDAY, NOV. 24TH.

The Supply of Drugs.

Mr. PETO asked the Chancellor of the Exchequer whether his attention had been called to the scarcity and high price of aspirin and other salicylates, also of all coal-tar products such as phenacetin, antipyrin, &c., and of drugs requiring spirit in their manufacture; what steps he proposed to take to secure an adequate supply at a reasonable price during the war, in view of the large requirements of the hospitals; and whether he proposed to secure a larger production of drugs in this country by permitting the use of spirit free of all duty in their manufacture.—Mr. MCKENNA replied: The question of maintaining the supply of these important drugs has received very careful consideration at the hands of the department of the Insurance Commissioners. I fear that it is not possible within the limits of a Parliamentary reply to give any adequate statement of the steps that have been or are being taken to deal with the situation, but I understand that the position as regards available supplies is, on the whole, improving, and that there is no reason to anticipate any serious shortage in the future. It is not practicable to allow the use of duty-free spirit in the manufacture of drugs generally, but so far as it is practicable it is, or will be, allowed under the terms of the circular of which I am sending the honourable Member a copy.

Regulations of National Insurance Commission.

Mr. WILES asked the Representative of the National Health Insurance Commissioners whether he was aware that the action of the National Insurance Commissioners in introducing new regulations at the present time was considered by many members of the medical profession as a breach of the promise given by Sir Robert Morant in his letter to the secretary of the British Medical Association, dated March 17th, 1915, as well as of the terms of the official circular 201/I C.; and, if so, whether it had his sanction; had he been supplied with copies of the resolutions passed on Oct. 26th last by the London Panel Committee and by a mass meeting of practitioners at Bristol on Nov. 11th; and was he aware of the action recently taken by members of the Kent panel, in inviting doctors to withdraw their services after Dec. 31st.—Mr. C. ROBERTS answered: No, Sir, there has been no breach of any promises given, and I have no reason to think that medical practitioners generally are under any such mistaken impression as is suggested in the question in regard to the revision of the terms of their agreements with the Insurance Committees for the year 1916. The documents mentioned in the first part of the question dealt only with contingencies contemplated during the year 1915, which have not in fact arisen. Steps have been taken to remove any misapprehensions which may have

been caused in the areas mentioned in the last part but one of the question. I have not previously heard of the circumstances referred to in the last part, but if doubts are created in any practitioner's mind as to the facts of the position he can obtain full information either from the Insurance Committee or from my department.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BUCHAN, T., M.B., Ch.B. Edin., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Laurencekirk District of the county of Kincardine.

EVANS, O. C. P., M.D. Durh., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Kidderminster District of the county of Worcester.

FOSTER, ANNIE, M.R.C.S., L.R.C.P., has been appointed to the Medical Staff of the Nottingham General Hospital.

GLEN-BOTT, Miss, M.R.C.S., L.R.C.P., has been appointed to the Medical Staff of the Nottingham General Hospital.

PARKINSON, K. H., M.R.C.S., L.R.C.P., has been appointed to the Medical Staff of the Nottingham General Hospital.

THORP, H., M.B., Ch.B. Vict., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Todmorden District of the county of Yorks, West Riding.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BENGAL, INDIA, ASANSOL MINES BOARD OF HEALTH.—Chief Sanitary Officer for Asansol Mining Settlement. Salary Rs.1200 a month, with house.

BIRKENHEAD, BOROUGH HOSPITAL.—Junior House Surgeon. Salary £180 per annum, with board and laundry.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BOLTON INFIRMARY AND DISPENSARY.—Third House Surgeon. Salary £180 per annum, with apartments, board, and attendance.

BRISTOL GENERAL HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, residence, &c.

BRISTOL ROYAL INFIRMARY.—House Physicians and House Surgeons. Salary at rate of £120 per annum, with board, apartments, and laundry.

BUXTON, DERBYSHIRE, DEVONSHIRE HOSPITAL.—Assistant House Physician for six months. Salary £100 per annum, with apartments, board, and laundry.

CAMBRIDGESHIRE ASYLUM, Fulbourn, near Cambridge.—Junior Assistant Medical Officer, unmarried. Salary £200 per annum, with board, lodging, washing, and attendance.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—House Surgeon. Salary £200 per annum, with board, residence, &c.

DERBYSHIRE HOSPITAL FOR SICK CHILDREN.—Female Resident Medical Officer for six months. Salary £200 per annum.

DORCHESTER COUNTY ASYLUM, Dorset.—Medical Superintendent. Salary £800 per annum, with house (partly furnished), stables, garden, coals, light, laundry, &c.

DUDLEY, GUEST HOSPITAL.—Senior Resident Medical Officer. Salary £150 per annum, with board, residence, attendance, and washing. Also Assistant House Surgeon for six months. Salary £120 per annum, with residence, board, and washing.

DUNDEE, BALDOVAN CERTIFIED INSTITUTION FOR THE TREATMENT AND EDUCATION OF THE FEEBLE-MINDED.—Resident Medical Superintendent. Salary £400 per annum, with board and lodgings.

GLAMORGAN COUNTY ASYLUM, Bridgend.—Temporary Assistant Medical Officer. Salary £250 per annum, with board, apartments, attendance, and laundry.

HAMPSTEAD GENERAL HOSPITAL, Haverstock-hill, N.W.—Resident Medical Officer for three months. Salary £200 per annum, with usual allowances.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

LEEDS GENERAL INFIRMARY.—Resident Aural Officer. Salary £100 per annum, with board, residence, and laundry.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £130 per annum, with board, residence, and laundry.

LEICESTER ROYAL INFIRMARY.—Assistant House Surgeon for six months. Salary at rate of £250 per annum, with board, apartments, &c.

LIVERPOOL, DAVID LEWIS NORTHERN HOSPITAL.—House Surgeon and House Physician for six months. Salary at rate of £100 per annum, with board.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Assistant Resident Medical Officer for six months. Salary at rate of £120 per annum, with board, lodging, and laundry.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with apartments and board.

MIDDLESBROUGH, NORTH RIDING INFIRMARY.—Female Resident Surgeon. Salary £120 per annum, with board, apartments, and laundry.

MILROY LECTURES ON STATE MEDICINE AND PUBLIC HEALTH.—Milroy Lecturer for 1917.

PORTSMOUTH ROYAL HOSPITAL.—House Surgeon for six months. Salary £150 per annum, with board, &c.

PUTNEY HOSPITAL, Putney Common, S.W.—Resident Medical Officer. Salary £150 per annum, with residence, board, and laundry.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Temporary Medical Officer. £25 per annum to cover travelling expenses.

RHONDDA URBAN DISTRICT COUNCIL.—Temporary Assistant Medical Officer of Health and School Medical Officer. Salary £350 per annum.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Third House Surgeon. Salary at rate of £50 per annum, with board and residence. Also Assistant Surgeon.

ST. PANCRAS, LONDON.—Senior Assistant Medical Superintendent of the South Infirmary, Pancras-road, N.W., and Senior Assistant Medical Officer of House adjacent. Salary at rate of £225 per annum, with board, apartments, and washing.

ST. MARY'S HOSPITAL, Paddington, W.—Assistant Ophthalmic Surgeon for five years.

SLEAFORD, KESTEVEN COUNTY ASYLUM, Lincolnshire.—Assistant Medical Officer.

SOUTH LONDON HOSPITAL FOR WOMEN, 88–90, Newington-causeway, S.E.—Female Assistant Physician and Temporary Female Assistant Surgeon, latter appointment for six months.

SOUTHAMPTON, FREE EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board, lodging, and laundry.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—Junior House Surgeon. Salary £120 per annum, with rooms, board, and washing.

VENTNOR, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST ON THE SEPARATE PRINCIPLE.—Senior Resident Medical Officer. Salary £250 per annum, with board and lodging.

WANDSWORTH UNION INFIRMARY, Ouseley-road, Balham, S.W.—First Assistant Medical Officer, unmarried. Salary at rate of 5 guineas per week, with board, lodging, and washing.

WARRINGTON, LORD DERBY WAR HOSPITAL.—Chief Resident Surgeon. Salary £1 3*s.* 6*d.* per day, with board, lodging, and washing. Also Pathologist. Salary £1 per day, with board, lodging, and laundry.

WIGAN COUNTY BOROUGH EDUCATION DEPARTMENT.—Assistant School Medical Officer. Salary £300 per annum.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Female House Surgeon. Salary £150 per annum, with board, apartments, and washing.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Cleator, in the county of Cumberland; at Crewkerne, in the county of Somerset; and at Wolston, in the county of Warwick.

Births, Marriages, and Deaths.

BIRTHS.

BROWNE.—On Nov. 14th, at Haddington-terrace, Kingstown, Co. Dublin, the wife of Captain T. Walker Browne, R.A.M.C., of a daughter.

COOPER.—On Nov. 16th, at Lansdowne, Hampton, Middlesex, the wife of Harold Merriman Cooper, M.B. Lond., of a daughter.

MCKERROW.—On Nov. 19th, at Bramshott Chase, Hindhead, the wife of C. K. McKerrow, M.B. Cantab., R.A.M.C., of Ayr, of a son.

NEVE.—On Nov. 18th, at Dingwall-road, Croydon, the wife of Clement Treves Neve, F.R.C.S. Eng., Lieutenant, R.A.M.C., of a daughter.

PALMER.—On Nov. 19th, at "Craigielea," Maxwelltown, Dumfries, the wife of Captain H. S. Palmer, R.A.M.C. (T.F.), of a son.

SASS.—On Oct. 19th, at Dalmeny-avenue, N., the wife of Wilfrid Sass, M.R.C.S., L.R.C.P. Lond., of a son.

STEEL.—On Nov. 19th, at The White Cottage, Malvern Common, Malvern, the wife of Captain O. W. D. Steel, R.A.M.C. (T.F.), of a daughter.

MARRIAGES.

DYSON—CORNISH.—On Nov. 20th, at St. Stephen's, Hampstead, Captain Ernest Andrews Dyson, M.B. Cantab., R.A.M.C., to Minnie, younger daughter of Mr. and Mrs. H. J. Cornish, of Lawn-road, Hampstead, N.W.

HUNT—STRAUSS.—On Nov. 20th, at Christ Church, Lancaster-gate, Captain George Herbert Hunt, R.A.M.C. (T.), to Rosie Evelyn, daughter of the late A. H. Strauss and of Mrs. Strauss, of Lancaster-gate.

SMEED—BURTT.—On Nov. 25th, at St. Luke's Church, Hampstead, by the Rev. J. M. Willoughby, D.D., Captain Edward Smeed, R.A.M.C. (T.F.), son of Mr. and Mrs. Smeed of "Holmcroft," Elm Grove, Southsea, to Mildred, daughter of Mr. and Mrs. W. F. Burtt, of "Northwood," Burgess Hill, Hampstead, N.W.

VEVERS—ANDREWS.—On Nov. 22nd, at St. John's Church, Girvan, Ayrshire, Geoffrey Marr Vevers, Lieutenant, R.A.M.C., to Catherine Rigby, daughter of the late David Andrews.

DEATHS.

BASTIAN.—On Nov. 17th, at Chesham Bois, Henry Charlton Bastian, M.A., M.D. Lond., F.R.S.

CREASE.—On Nov. 20th, at Ogle-terrace, South Shields, James Robertson Crease, F.R.C.S., L.R.C.P. Edin., J.P., aged 76 years.

JEFFERY.—On Nov. 17th at Carter's Corner Place, Hailsham, George Augustus Jeffery, M.D., J.P., formerly of Eastbourne, aged 91 years.

MASON.—On Nov. 18th, at 49, George-street, Portman-square, W., George Armstrong Mason, M.A., M.B., B.C. Cantab., aged 58 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SOME RARE BOOKS.

A MEDICAL man disposing of his library would like to bring to the notice of our readers the following books which he thinks might interest some of them.

Quinque Illustrium Poetarum: Ant. Panormitae; Ramusii, Arminiensis; Pacifici Maximi, Asculani; Ioan. Ioviani Pontani; Ioan. Secundi, Hagiensis. Lusus in Venerem Partim ex Codicibus Manuscriptis nunc primum editi. Parisiis Prostat ad pistrinum in vico suavi. M.DCC.XCI.

The Epigrams of M. Val. Martial, in twelve books. With a Comment by James Elphinston. London. Printed by Baker & Galabin, Ingram Court, Fenchurch Street, and sold (Price a guinea in Boards) by B. White, Fleet Street; C. Dilly, Poultry; J. Robson, Bond St.; J. Walter, Charing Cross; P. Elmsly, Strand; J. Bew, Paternoster Row; D. Prince & J. Cook, Oxford; J. Deighton, Cambridge; W. Creech & J. Dickson, Edinburgh; MDCCLXXXII. One cover loose.

Caji Suetonii Tranquilli Opera et in illa Commentarius Samuelis Pitisci in quo Antiquitates Romanae ex auctoribus idoneis fere nongentis, Graecis et Latinis, veteribus et recentioribus perpetuo tenore explicantur. Huic accedunt terni Indices—I. Editionum. II. Auctorum cum laudatorum tum obiter notatorum, emendatorum, explicitorum. III. Rerum absolutissimus et locupletissimus. Imperatorum Imperatoresque arctissimo gradu contingentium icones: et figurae ex veterum monumentis ad historiam illustrandam depromptae Editio secunda priori ornatior et limatior Leonardiae Excudit Franciscus Halma. D. Ordinum. Frisiae Typographus ordinarius. CIↃ IↃ CCXIV. 2 vols., vellum. Good condition.

A Poetical Translation of the Works of Horace. With the original Text & Critical Notes collected from his best Latin and French Commentators. By Philip Francis, D.D. In four volumes. The seventh edition. Revised & Corrected. London: Printed for A. Millar in the Strand. MDCCLXV. Good condition. Bound in vellum.

Λουκιανου Σαμοσατεως απαντα. Luciani Samosatensis Opera cum nova versione. Tiber. Hemsterhusii & Io. Matthiae Gesneri, Graecis Scholiis ac Notis omnium proximae Editionis Commentatorum, additis Io. Brodael, Io. Iensii, Lud. Kusteri, Lamb. Bossi, Hor. Vitringae. Ioan de la Faye, Ed. Leedes, aliisque ineditis, ac praecipue Moses Solani et I. M. Gesneri. Amstelodami: Sumptibus Iacobi Westenii CIↃ IↃ CC XLIII. Three volumes and separate index. Binding not in very good condition.

Las seis Comedias de Terencio Conforme a la edicion de Faerno, Impresas en Latin i traducidas en Castellano por Pedro Simon Abril Natural de Alcaráz (2 vols.). Dedicadas al mui alto i mui poderoso Sr. Dn. Fernando de Austria, Principe de las Españas. En Valencia. Ano M.DCC.LXII. En la Oficina de Benito Monfort, junto al Hospital de los Estudiantes.

The books do not fall exactly in the category either of our correspondent's medical works or of his works on general literature, and he hopes to dispose of them separately.

THIRTEEN MEDICAL MEN IN A COMPENSATION CASE.

A MASTER mariner who fell and strained his thigh was, according to the *Manchester Daily Dispatch*, attended by 13 medical men and had ten X ray photographs taken in order to decide the nature of the injury.

THE USE OF THE ONION AND GARLIC.

To the Editor of THE LANCET.

SIR,—Referring to the note on the use of the onion and garlic in your issue of Nov. 20th perhaps an extract from "Culpepper's Herbal Improved," by Richard Brook, published in 1847, may be of interest. Mr. Brook interspersed his botany with caustic comments on social topics, but the following is probably meant as a narration of fact:—

"Garlic has been found one of the most valuable remedies for the asthma. Dr. Bowles obtained great popularity and accumulated a large fortune by the secret use of this herb. His method was to boil the bulbs till quite tender, in a covered vessel, then dry them carefully in a cloth. He then added an equal quantity of the strongest vinegar, to the water in which they had been boiled, and made the whole into a syrup, by adding sugar. The syrup thus made was poured over the dried bulbs, and the whole put into a jar well stopped up for use. The patient took one or two of the bulbs in the morning *fasting* with one or two tablespoonsful of the syrup. An ounce or two ounces of the juice may be taken together with an equal quantity of sugar, for one dose. It is also useful to be taken in the form of pills, with an equal quantity of soap, about four grains of the compound to one pill, four or five to be taken morning and evening. A few caraway seeds mixed with the composition will take away the offensive taste and smell of the garlic."

I am, Sir, yours faithfully,

Nov. 22nd, 1915. ALLIUM.

"WILLING" BADGES FOR THE MEDICALLY UNFIT.

EVIDENCE of medical unfitness for military service is but rarely visible to the casual observer, and many who wish to bear arms in the service of their country and have been refused are naturally desirous of wearing some token of their willingness in order to face the host of amateur canvassers who are apt to class them with the shirker. Mr. St. Loe Strachey established such a "willing" badge for Surrey men, who are applying for it at the rate of 150 a week.

SILVER PAPER FOR CHARITY.

WE published a few lines under the above heading in THE LANCET of June 12th, showing how the collection of silver paper by children in East Ham had resulted in the sum of £8 15*s.* being obtained for it and presented to the local hospital. Since then the *Daily Express* has started a similar collection for presents for soldiers, and has already raised about £40 and has sacks of material upon which it hopes to raise a much more substantial sum, probably nearer £150. There is money in the treatment of unconsidered trifles, but organised effort is, of course, essential. There are probably other unsuspected ways of benefiting charities by what is now waste material. We learn that canisters, paint-boxes, and similar tin receptacles are getting scarce, and jars and bottles for various purposes are becoming valuable. Any collection of these should be worth something.

Chloroform.—The apparatus in question has advantages and drawbacks, but it is extensively used and has many supporters.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Mr. W. H. Young: Note on the Existence of Converging Sequences in Certain Oscillating Successions of Functions.—Mr S. A. Shorter and Mr. S. Ellingworth: On the Emulsifying Action of Soap a Contribution to the Theory of Detergent Action (communicated by Prof. W. H. Bragg).—Mr. P. E. Shaw: The Newtonian Constant of Gravitation as Affected by Temperature (communicated by Mr. C. V. Boys).—Mr. G. I. Taylor: Skin Friction of the Wind on the Earth's Surface (communicated by Sir N. Shaw).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Friday, Dec. 3rd.

LARYNGOLOGY (Hon. Secretaries—Cecil I. Graham, C. W. M. Hope): at 4 P.M.

Cases and Specimens will be shown.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—8.30 P.M., Paper:—Dr. L. Hill: Gas Poisoning—Physiological Symptoms and Clinical Treatment.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital, Hammersmith-road, W.

FRIDAY.—8.30 P.M., Meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman and Mr. Gibb: Diseases of the Eye.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women. Mr. Gibb: Diseases of the Eye.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M.: Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out patients (Dr. A. G. Auld); Surgical Out patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks). 4.30 P.M., Clinical Demonstration:—Mr. A. S. Worton: Selected Eye Cases.

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles) Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

For further particulars of the above Lectures, &c., see Advertisement Pages.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager." We cannot undertake to return MSS. not used.*

MANAGER'S NOTICES.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

ALTERATION OF INLAND SUBSCRIPTION RATES.

OWING to the alteration in the Inland Newspaper Postal rate, the postage on each copy of THE LANCET will in future be 1*d.*, and sometimes 1½*d.*

The revised Inland Subscription rates are:—

One Year	...	...	...	£1 3 3
Six Months	...	...	...	0 13 8
Three Months	...	...	...	0 7 0

The rates for the Colonies and Abroad (thin paper edition) will be as usual:—

One Year	...	...	...	£1 5 0
Six Months	...	...	...	0 14 0
Three Months	...	...	...	0 7 0

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

THE Secretary of the War Office has issued the following order:—

The public are informed that on and after Saturday, November 6th, newspapers, magazines, books, and other printed publications (other than trade circulars) will not be sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. Persons desiring to send newspapers, &c., to neutral European countries should, therefore, give their orders for execution to publishers or newsagents who have obtained such permission.

The Publisher of THE LANCET has obtained the required permission of the War Office, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

METEOROLOGICAL READINGS.

(Taken daily at 9.30 a.m. by Steward's Instruments.)

THE LANCET Office, Nov. 24th, 1915.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Nov. 18	30·296	N.	0·09	43	43	32	33	33	Foggy
,, 19	30·440	E.	...	54	44	33	36	37	Overcast
,, 20	30 6·0	E.	...	64	44	37	37	39	Cloudy
,, 21	30 610	N.	...	44	42	39	38	40	Overcast
,, 22	30 510	N.E.	...	45	43	39	39	41	Overcast
,, 23	30 200	N.	...	45	45	33	33	33	Overcast
,, 24	30·204	N.E.	...	59	43	33	37	39	Cloudy

The following magazines, journals, &c., have been received:—Tropical Medicine and Hygiene, St. Barth lomew's Hospital Journal, Dublin Journal of Medical Science, Modern Hospital, Pharmaceutical Journal, Journal of Laryngology, Rhinology, and Otology, Surgery, Gynecology, and Obstetrics, Canadian Journal of Medicine and Surgery, Maryland Medical Journal, Canadian Medical Association Journal, Brain, Medical Review of Reviews, Ophthalmology, Birmingham Medical Review, Symons' Meteorological Magazine, Archives of Radiology and Electrotherapy, British Journal of Dental Science, Canada Lancet, Review of Neurology and Psychiatry, Canadian Practitioner and Review, Annaes Paulistas de Medicina e Chirurgia, Leather Trades Review, Annales de Médecine, British Dental Journal, Tropical Diseases Bulletin, American Journal of Surgery, Medical Chronicle, Archives of Pediatrics, Bulletin of the Johns Hopkins Hospital, Albany Medical Annals Pediatrics, Journal of Nervous and Mental Disease, Psychoanalytic Review, Transactions of the Society of Tropical Medicine, American Medicine, Midland Medical Journal.

Communications, Letters, &c., have been received from—

A.—Messrs. Allen and Hanburys, Lond.; Mr. M. Anthony, Lond.; Mr. E. F. Ackery, Lond., Messrs. Arnold and Sons, Lond.; Army and Navy Male Nurses' Co-operation, Lond., Secretary of; Dr. S. Adleman, Roxbury, U.S.A.; Army Medical Service, Lond., Director-General of; Mr. J. M. Adam, Saranac Lake; Mr. Sidney E. Atkins, Exeter.

B.—Dr. J. L. Bogle, Bordighera; Messrs. Baxter and Son, Lond.; Messrs. Burroughs Wellcome and Co., Lond.; Bolton Infirmary and Dispensary, Secretary of; Birmingham City Education Committee, Secretary of; Dr. T. H. Butler, Leamington Spa; Lieutenant-Colonel G. Bray, R.A.M.C., Lond.; Captain A. G. Biggar, R.A.M.C., France; Mr. C. Bowen, Lond.; Dr. W. Bligh, Caterham; Dr. M. L. A. Bolleau, Wymondham; Colonel S. H. Browne, I.M.S., Lond.; Colonel Andrew Balfour, C.M.G., Lond.; Sir George Beatson, Glasgow; Mr. W. J. Billington, Lond.; Dr. W. C. Bosanquet, Lond.; Dr. F. R. Batten, Lond.; Surgeon-General Sir Anthony Bowlby.

C.—Dr. L. Colebrook, Lond.; Mr. J. H. Callender, North Shields; Messrs. Cowie and Co., Lond.; Miss G. Condray, Le Breil-sur-Meuze; Miss Edith Calkin, Lond.; Mr. George C. Curnock, Lond.; Messrs. H. Cook and Co., Lond.; Mr. J. Jackson Clarke, Lond.; Dr. H. Christensen, New Westminster; Mr. J. F. Colyer, Lond.; Dr. Raymond Crawfurd, Lond.; Dr. S. D. Clippingdale, Lond.; Dr. Harry Campbell, Lond.; Dr. Ronald G. Canti, Lond.; Mr. J. Robinson Crease, South Shields.

D.—Dr. W. A. Daley, Bootle; Derbyshire Royal Infirmary, Derby, Secretary of; Lord Derby War Hospital, Warrington, Clerk to the; Mr. Percy Dunn, Lond.; Messrs. Dawson and Sons, Lond.; Messrs. Down Bros., Lond.; Mr. R. Donald, Lond.; Sir Bertrand Dawson, K.C.V.O., Lond.; Mrs. W. Du Pré, Lond.; Mr. E. Guy Dawber, Lond.

E.—Epsom College, Secretary of; Captain T. P. Edwards, R.A.M.C., France; Lieutenant H. Roke Evans, R.A.M.C., Malta; "Emily Mangles" Convalescent Home, Hale, Lady Superintendent of; Messrs. Elliott, Son, and Boyton, Lond.

F.—Dr. Richard B. Faulkner, Pittsburgh; Factories and Workshops, Chief Inspector of, Lond.; Ford Motor Co., Manchester; Mr. W. E. Franklin, Newcastle-on-Tyne; Sir David Ferrier, Lond.; Dr. David Forsyth, Lond.

G.—Lieutenant-Colonel E. Goodall, R.A.M.C.; Mr. J. F. Gie, Lond.; Messrs. Gordon and Gotch, Lond.; Dr. A. S. Gubb, Aix-les-Bains; Govan District Asylum, Medical Superintendent of; Lieutenant R. H. Green, R.A.M.C., France; Glasgow Lock Hospital, Acting Secretary of.

H.—Dr. Wilfred Harris, Lond.; Mr. Hemsted, Liverpool; H.M. Stationery Office, Lond., Director of; Dr. J. J. H. Holt, Middleton; Hunterian Society, Lond., Hon. Secretaries of; Messrs. C. J. Hewlett and Son, Lond.

I.—Insurance Committee for the County of London, Clerk of.

J.—Dr. Sydney Jamieson, Belper; Jenner Institute for Calf Lymph, Lond.

K.—Messrs. H. S. King and Co., Lond.; Captain C. Killick, R.A.M.C., Tring; Rt. Hon. Lord Knutsford, Royston; Messrs. P. S. King and Son, Lond.; Dr. H. Cameron Kidd, Bromsgrove.

L.—Dr. T. H. Lutaif, Khartoum; Leeds Public Dispensary, Secretary of; London Hospital Medical College, Dean of; Messrs. Lee and Nightingale, Liverpool; Local Government Board, Lond., Medical Officer to; Leicester Royal Infirmary, Secretary of; London and Counties Medical Protection Society, General Secretary of; Leeds General Infirmary, Manager of; Dr. T. D. Luke.

M.—Dr. J. N. Matthews, Retford; Maltine Manufacturing Co., Lond.; Dr. J. McIntosh, Lond.; Lieutenant L. S. Machado, I.M.S., Egypt; Dr. C. G. May, Lond.; Mr. W. Martindale, Lond.; Captain A. Mowat, R.A.M.C., Diss; Mr. M. S. Mayou, Lond.; Captain W. L. Maclean, France; Dr. H. W. McConnel, Steyning; Messrs. Mather and Crowther, Lond.; Mrs. Meers, Lond., Mr. R. Foster Moore, Lond.; Mr. W. Colin Mackenzie, Lond.; Dr. Stanley Melville, Lond.

N.—National Health Insurance Commission (England), Lond., Secretary of; National Land and Home League, Lond., Acting Secretary of; Mr. B. Nazer, Lond.; *New York World*, New York; National Provident Institution, Lond., Secretary of.

O.—Corporal J. H. Overy, Lond.; Mr. Arthur W. Ormond, Lond.; Sir William Osler, Bart., Oxford; Rear-Admiral K. Oguri, I.J.N., Lond.

P.—Dr. G. J. Pierse, Lixnaw; Mr. C. Arthur Pearson, Lond.; Messrs. G. P. Putnam's Sons, Lond.; Panel Committee for the County of London.

R.—Rhondda Urban District Council, Medical Officer of Health of; Messrs. Robertson and Scott, Edinburgh; Royal Academy of Medicine in Ireland, Dublin; Royal Society of Arts, Lond., Secretary of; Mr. K. Ram, Entebbe; Royal Society, Lond.; Dr. R. R. Rentoul, Liverpool; Registrar-General for Ireland, Dublin; Royal Sanitary Institute, Lond. Secretary of; Professor W. H. R. Rivers, Maghull; Lieutenant-Colonel R. D. Rudolf, C.A.M.C.

S.—Dr. Wood Smith, Harrogate; Messrs. G. Street and Co., Lond., Messrs. W. A. Schultz, and Co., Lond.; Smith's Advertising Agency, Lond.; Mr. W. B. Saw, Lond.; Dr. J. E. Stowers, St. Valery-en-Caux; Lieutenant R. Svennson, R.A.M.C., Sutton Veney; Professor W. St. C. Symmers, Belfast; Dr. G. Waugh Scott, Sungei Siput, Perak; Dr. Ettie Sayer, Lond.; Professor W. Stirling, Manchester; Dr. Francis E. Shipway, Lond.; Sir G. H. Savage, Lond.; Captain F. J. Stansfield, R.A.M.C.(T).

T.—Mr. T. Thomas, Penybont; Mr. F. W. Twort, Lond.; *The Times*, Lond., Secretary of; Mr. J. W. Thomson-Walker, Lond.; Dr. G. Crewdson Thomas, Lond.; Mr. A. A. Tindall, Lond.; Dr. Sydney Thompson, Lond.; Mr. J. R. Thomas, Hirwain.

V.—Victoria Hospital, Burnley, Secretary of.

W.—Dr. C. M. Wenyon, Lond.; West London Hospital Post-Graduate College, Dean of; Messrs. Willing and Co., Lond.; Messrs. Walton and Curtis, Lond.; Mr. C. Worth, Lond.; Messrs. T. Wall and Sons, Wigan; Messrs. W. Wood and Co., New York; West Ham and Eastern General Hospital, Secretary of; Messrs. J. Wright and Sons, Bristol; Dr. F. J. Waldo, Lond.; Messrs. Williams and Co., Lond.; Mr. P. W. Wilson, Hendon; Mr. C. G. Russ Wood, Shrewsbury; Mr. Percy M. Wallace, Lond.; Mr. Cuthbert Wallace, Bournemouth; Lieutenant Adam White, R.A.M.C.(T.).

Letters, each with enclosure, are also acknowledged from—

A.—Ashwood House, Kingswinford, Medical Superintendent of; Mr. T. L. Ashforth, Doncaster; Dr. A. Ashkenny, Winchester; Ardath Tobacco Co., Lond.

C.—Messrs. Callard, Stewart, and Watt, Lond.; Mrs. Cant, Lincoln; Mr. F. de B. Collenette, Barra; Mr. H. Conrad, Lond.; Dr. R. Cook, Leiston; C. H.

D.—Monsieur Dehorter, Calais.

E.—Mr. E. Evans, Felinfach.

G.—Dr. Gates, South Woodchester; G. F.

H.—Messrs. Heywood, Manchester; Hereford County and City Asylum, Clerk to the; Captain P. Hayes, R.A.M.C., Neemuch.

I.—Invernith Sanatorium, Colinsburgh, Medical Superintendent of; Ingress Abbey Military Hospital, Greenhithe, Hon. Secretary of.

J.—Dr. J. D. Jones, Singapore; Dr. F. Silva Jones, Lond.

K.—Kirkmabreck Parish Council, Creetown, Clerk to the.

L.—Mr. T. S. Logan, Stone; Miss Lind-af-Hageby, Lond.; Messrs. H. K. Lewis and Co., Lond.; L. H.

M.—Dr. D. Mackinnon, Tiree; Captain J. A. C. Mackintosh, R.A.M.C., France; Dr. N. Morris, Warrington; Surgeon J. H. B. Martin, R.N., Lond.; Dr. J. B. McDougall, Bursiem; Messrs. J. Menzies and Co., Edinburgh.

N.—Lord Northcliffe, Lond.; Norwood Sanatorium, Beckenham, Medical Superintendent of; New Duff House Sanatorium, Banff, Secretary of.

O.—Mr. J. O'Shea, Birmingham.

P.—Mr. F. G. Pulman, Lond.; Mr. J. R. Purvis, Cambridge; Mr. F. C. Poynder, East Grinstead; Dr. Packman, Rochester.

R.—Miss Rattray, Haslemere; Royal National Sanatorium, Bournemouth, Secretary of; Royal Portsmouth Hospital, Secretary of; R. B. H. W.; Professor J. Ritchie, Edinburgh; Major L. Reynolds, I.M.S., France; Dr. H. Robinson Lond.

S.—Messrs. W. H. Smith and Son, Birmingham; Captain H. Smeed, R.A.M.C.(T.), Netley; Messrs. Spiers and Pond, Lond.

T.—Dr. Batty Tuke, Pelton; T. B.; Mrs. Thwaites, Lond.; Surgeon Major M. Taylor, France; Messrs. Tippetts, Lond.; Mr. D. Thomson, Gorleston; Dr. Thresh, Lond.

V.—Lieutenant Vickers, R.A.M.C.

W.—Dr. J. H. Wilson, Lond.; Mr. J. R. Woodcock, Wilmslow; Westmorland Sanatorium, Meathorp, Treasurer to the; Messrs. W. J. Wilcox and Co., Lond.; Warrington Infirmary, Secretary of; Mr. A. Wilson, Lond.; Mr. A. H. Weller, Malvern; Wharncliffe War Hospital, Sheffield, Clerk to the; Mr. W. W. Wells, Lond.; Messrs. J. Willing, Lond.

Y.—Dr. A. M. F. de Ybarra, Havana.

EVERY FRIDAY. **THE LANCET.** PRICE SIXPENCE.

SUBSCRIPTION POST FREE.

FOR THE UNITED KINGDOM.		TO THE COLONIES and ABROAD.	
One Year	£1 3 3	One Year	£1 5 0
Six Months	0 13 8	Six Months	0 14 0
Three Months	0 7 0	Three Months	7 0

Subscriptions (which may commence at any time) are payable in advance.

ADVERTISING.

Books and Publications ... ... / Official and General Announcements / Trade and Miscellaneous Advertisements and Situations Vacant ...	Five Lines and under £0 4 0 / Every additional Line 0 0 6

Situations wanted: First 30 words, 2s. 6d.; per additional 8 words, 6d. Quarter Page, £1 10s. Half a Page, £2 15s. An Entire Page, £5 5s. Special terms for Position Pages.

An original and novel feature of "THE LANCET General Advertiser" is a Special Index to Advertisements on pages 2 and 4, which not only affords a ready means of finding any notice but is in itself an *additional* advertisement.

Answers are now received at this Office, by special arrangement, to advertisements appearing in THE LANCET.

The Manager cannot hold himself responsible for the return of testimonials, &c., sent to the Office in reply to advertisements; copies only should be forwarded.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

Cheques and Post Office Orders (crossed "London County & Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Office, 423, Strand, London, to whom all letters relating to advertisements or subscriptions should be addressed.

THE LANCET can be obtained at all Messrs. W. H. Smith and Son's and other Railway Bookstalls throughout the United Kingdom. Advertisements are also received by them and all other Advertising Agents.

Agents for the Advertisement Department in France—SOCIÉTÉ EUROPÉENNE DE PUBLICITÉ, 10, Rue de la Victoire, Paris.